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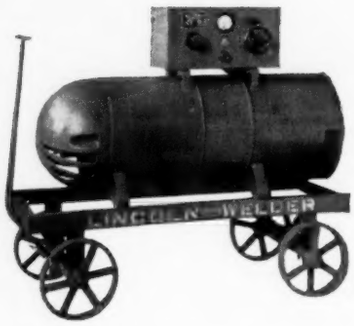

"This roll changing hook is made from the product of our own mills. You should thank me for welding it by the shielded arc process with 'Fleetweld' electrodes. We got stronger, more ductile and corrosion resistant welds . . . and got fast welding, too."

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2. Weld faster per K. W. H.
3. Reduce cost per unit of welding—the unit being per foot of weld, or per pound of weld metal, or per hour of welding.

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W 31

Volume 92 Number 9

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

CORROSION, 67,000,000 gross tons; new production, 35,500,000 tons! Such is the score of the world-wide contest waged in 1932 between all of the natural enemies of steel on the one hand and demands upon the mills for replacements and fresh requirements on the other (p. 18). The calculation is by the eminent Sir Robert Hadfield. In the United States last year, output of 10,000,000 tons fell short of the 25,600,000 tons retired, leaving 487,283,000 tons in service Dec. 31. Since this approximates the tonnage at the close of both 1927 and 1928, corrosion and production appear to have fought a draw the past four years. The peak tonnage in service was 510,158,000 tons on Dec. 31, 1930. All figures are for finished rolled steel.

Markets Also Hope for "New Deal"

This showing supplies encouragement as the steel operating rate, after holding at 19 per cent for a month, has eased to 17 per cent (p. 33). A prolonged bank moratorium and basic readjustment in the district which is the industry's best customer—Detroit, impending momentous changes at Washington, the renewal of hositilities in the Far East with dangerous potentialities, the continued abstinence of two such important consumers as the railroads and the building industry—these adverse factors would sap even a robust market. Because the pattern for recovery specifies numerous reactions and a complete purging of the economic system, discouragement is tempered, and then, March holds the promise of the "new deal."

Far East Drawing Supplies from U. S.

Speaking of the Far East, both combatants are in the American market. . . . China is inquiring (p. 49) at Seattle for 3400 tons of relaying rails. . . . Out of 56,720 tons of iron and steel exported from the United States in January (p. 11), Japan took 24,662 tons, of which 22,614 tons was scrap. This bulge in scrap exports, toward which Italy contributed by draining out 7563 tons, put January exports up 2602 tons over December while imports were declining 8500 tons to 21,892 tons. . . . In 1932, a spokesman for the scrap industry points out (p. 12), Japan bought 164,000 tons or almost 30 per cent of all American iron and steel exports, shipping mostly from New York.

Adjust Tariff, Lower Taxes, Schwab Urges

This noteworthy increase in the favorable balance of foreign trade in January combines with a treasury decision (p. 11), in effect finding that there is no dumping of foreign iron and steel, to make a bad week for the domes-

This plaque, awarded by the A.I.S.C. to the Bayonne bridge, is 18-8 alloy made by Allegheny Steel Co. and cast by General Alloys Co. The seal is red and black Kloizenay (fused glass), with the background the same material in dark blue

tic front. . . . A revival of foreign trade, a steel leader maintains (p. 12), is requisite for recovery of business. . . . Charles M. Schwab, on his 71st birthday, sets up two essentials for improvement—adjustment of the tariff to bar cheap alien goods, and lower taxes. . . . One thing not likely to go lower is metal prices, the retiring head of the A. I. M. M. E. observing (p. 27) that the downward course appears halted.

Ride Control Comes Too Late for Detroit

Detroit is learning that every joyride, even an industrial one lasting a quarter century, must come to an end, and that the automobile industry can no more drive itself at top speed than its own product, without incurring a costly overhaul (p. 14). The banking crisis is being met fearlessly, and sounder leadership in the city is assured, but the immediate effect is to retard production and check releases for material. . . . Ford has sprung a surprise by offering a four-cylinder motor in the same chassis as the new V-eight (p. 15). Reports that his steelworks is passing to new control are persistent.

Now Castings Are in the Drama

Experiences of a foundry in determining and setting up a workable, efficient cost plan will be dramatized in a four-act play before the American Foundrymen's association convention in Chicago in June (p. 23). How to produce castings marketable at a profit will be the theme of the convention and its accompanying exhibition . . . . A midwest foundry is turning out high-strength cast iron, suitable for safe wheels or other small parts where great toughness is essential (p. 23), by melting 50 per cent steel scrap and the remainder pig iron and cast scrap and bringing the silicon content up to 2.50 per cent by cupola additions of silicon in briquet form.

For the Technical Mind:

Tie rods are not indispensible in open-hearth furnace construction (p. 24), semirigid top binding proving successful and preferable. . . . A new vacuum tube oscillator detects flaws and cracks in tungsten and molybdenum wire, copper tubing and similar materials (p. 26). A flaw causes a beat in a loud speaker actuated by electrical resistance. . . . In brazing large amortisseur windings on four synchronous motors, the electric resistance method effected (p. 21), a saving of 75 per cent in time, requiring only 4 man-hours per motor. . . . A newly-developed recording michrophotometer (p. 30) makes possible quantitative and qualitative analyses of furnace heats within 30 minutes.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of* STEEL *or of its editors.

Inequalities in Wage Rates

To the Editor:

In your issue of the 13th, you lay stress on the resistance to further reductions in wages and on the hope entertained by some for re-inflation of prices.

It is most unfortunate that "labor" and "wages" should be referred to collectively when there is such great diversity in the interests of "labor" in various branches.

It may be a fact that wages in the manufacturing industries have been reduced to a point below where they should be in relation to future price levels. This does not constitute a sound basis for objections to proper reductions in wages where reasonable reductions have not been made.

Reference to reports of the interstate commerce commission show that the wages paid railroad employes for 1931 and to Dec. 31, 1932, per hour of actual work had increased continuously over each previous year and that the 10 per cent reduction of February, 1932, only balanced the total increase during the period from 1925 to Dec. 31, 1931.

Starting with the year 1925, the average annual compensation of railroad employes corrected for reduced hours per worker per year to the 1929 basis for 1930 and 1931 is as follows:

	Compensation for time actuall worked	Adjusted to normal full hours in 1929 for 1930-31	Increase over preceding year
1925	$1639.96		
1926	1655.79		$15.83
1927	1677.24		21.45
1928	1706.45		29.21
1929	1744.03		37.58
1930	1714.43	$1775.42	31.42*
1931	1661.70	1803.83	28.41*

*On corrected basis

Salaries and wages in government service also held artificially at the previous inflated levels are in the same class as those of railroad workers.

In your editorial, you refer to the maintenance of purchasing power by maintenance of wages. In this connection, it must be considered that arbitrary action in fixing wages or prices does not increase purchasing power. It only transfers purchasing power from one group of citizens to another group. Whether the effect is beneficial or harmful depends entirely on whether robbing Peter to pay Paul does more harm to Peter than it does good to Paul. At the present time, the Peters of the factory and the farm are being robbed to pay the Pauls of transportation and government.

W. E. JOHNSON, President,
Minneapolis, Minn. Johnson Mfg. Co.

The editors of STEEL *agree with the main view expressed above, namely that salaries and wages for railroad, government and building employes are out of line and require downward adjustment. The purpose of the editorial in the Feb.* 13 *issue was to emphasize the injustice of further cutting wages in those branches of industry where deflation already has been carried too far. Mr. Johnson's statement of the artificially high railroad wage level makes clearer the inequalities existing in the various industries and should further strengthen our contention that there is no justification for* 10 *and* 15 *cent hourly rates in deflated industries while fantastically high rates still prevail in other divisions.*

Fight To Invoke Antidumping Penalty on Imports Is Lost

WASHINGTON—Frank Dow, acting commissioner of customs, has notified collectors throughout the country that "the bureau perceives of no purpose which would be served by further withholding appraisement," on iron and steel and other commodities on which the bureau requested that appraisements be withheld following the filing of complaints under the antidumping act of 1921.

The bureau has advised collectors that iron and steel imports and other commodities from those countries not affected by outstanding notices of suspected dumping can be appraised in the regular way, without regard to any question of dumping, if the appraisers have sufficient information in connection with any particular merchandise to show that it has not been imported at less than its fair value.

It is understood that this means that iron and steel imports can proceed without bond, in connection with dumping, unless they are from some country against which suspected dumping orders have already been issued.

In the official notice, mention is made of iron and steel imports only by circular letter numbers issued by the bureau. Specific reference in these circular letters is made to the withholding of appraisement of "various steel products imported from France, Belgium, Germany and the Grand Duchy of Luxemburg."

Reference is made also to the letter dated Sept. 12, 1932, in which collectors are advised of the complaint of the American Iron and Steel institute on a large number of iron and steel items as imported from "Germany, Belgium, France, and the Grand Duchy of Luxemburg."

The same official notice refers to the matter of manganese ore imports from the Union of Soviet Socialist Republics, Brazil, British India, and the African Gold Coast.

This official statement would seem to indicate that up to this time, as already pointed out in STEEL, no signs of dumping can be proved in connection with the complaints filed by the domestic steel industry and that appraisement is not to be withheld.

Weigh Iron by Color!

LESS than a millionth of an ounce of iron can be quantitatively determined by a method employed in the General Electric research laboratory.

The metal is converted into ferric thiocyanate, a solution whose redness depends on the amount of iron dissolved.

Ordinarily, the redness is determined visually, but more accurate measurements have been made possible by use of the recording color analyzer developed in the general engineering laboratory of the company.

Exports in Sharp Rise; Imports Fall

WITH exports of iron and steel products at the highest mark since May, 1932, and exceeding any month in that year except April, and imports showing the second consecutive month of shrinkage, the foreign trade situation in steel and iron is distinctly better, as shown by figures for January, 1933, by the bureau of foreign and domestic commerce, department of commerce.

Exports of iron and steel in January were 56,720 gross tons, which was 16,072 tons or 40 per cent greater than in January, 1932. They were 2602 tons greater than December, 1932. Imports at 21,892 tons were 9161 tons less than in January, 1932, a downward difference of 30 per cent. The decline from December, 1932, was 8500 tons.

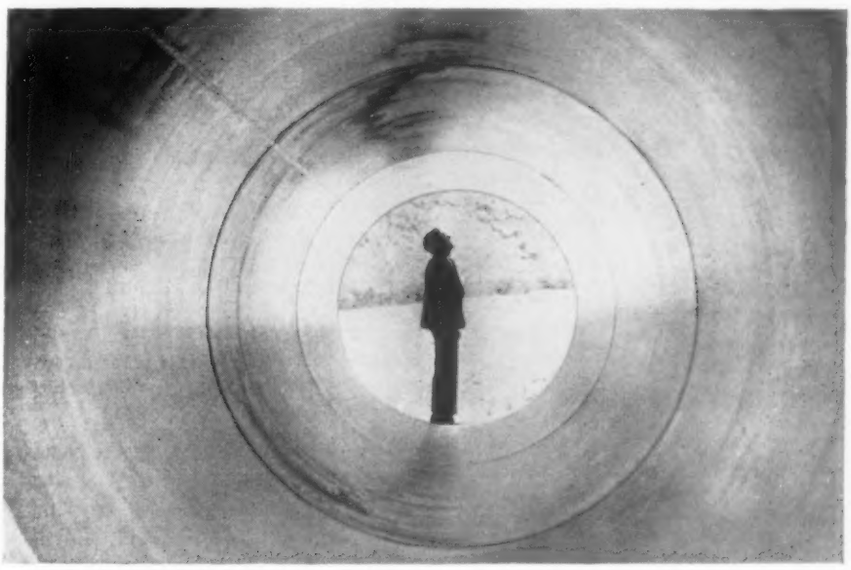
In exports, three classes made strong gains, more than sufficient to overcome losses of small amounts in 40 individual classes of products. Heavy rails gained over December, 1932, by 2048 tons, scrap gained 1665 tons and galvanized steel sheets rose 942 tons. Other gains of interest, though in smaller tonnage, were made in pig iron, black steel sheets, tin plate and car wheels and axles.

Japan continued the best market for exports in January, with purchases of 24,662 tons, of which 22,614 tons were scrap. Italy with purchases of 7563 tons of scrap took second place and Canada was third with

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1933		1932	
	Imports	Exports	Imports	Exports
Jan.	21,892	56,720	31,053	40,660
Feb.	.....	.....	26,738	40,492
March	.....	.....	41,031	49,927
April	.....	.....	36,339	58,118
May	.....	.....	39,751	80,477
June	.....	.....	34,494	52,081
July	.....	.....	18,005	52,558
Aug.	.....	.....	23,623	32,955
Sept.	.....	.....	29,241	36,038
Oct.	.....	.....	33,693	41,226
Nov.	.....	.....	34,924	56,041
Dec.	.....	.....	29,390	54,118
Total	.....	.....	378,282	594,691



STEEL CAN BE SMOOTH AS SILK. One section of the 7-foot diameter 1400-foot long penstock at the San Francisquite power plant No. 2 of the Los Angeles bureau of power and light hydroelectric system. The plates were arc welded. Photo courtesy of the Lincoln Electric Co., Cleveland

4162 tons. Philippine Islands took 3630 tons, the largest item being 1959 tons of galvanized sheets. China took 1251 tons of tin plate in a total of 2721 tons of purchases.

Chief loss in imports was in pig iron, 7800 tons, reflecting withdrawal of British and Dutch makers from this trade. Structural shapes were also sharply reduced by 2493 tons. In contrast to these declines, imports of ferromanganese were 2557 tons larger and barbed wire 1196 tons heavier. Increases in 11 other classes kept the January decline from being precipitate.

Belgium sent most imports with a total of 5508 tons, including 1263 tons of merchant steel bars, 1351 tons of shapes and 961 tons of sheets. Germany sent 3996 tons, including 1565 tons of barbed wire. India's contribution was 3209 tons, all pig iron, bringing its tonnage to approximately the level prevailing before July, 1932.

Iron ore imports rose sharply in January to a total of 14,084 tons, 6950 tons from Norway, 6800 tons from Soviet Russia and the remainder from Mexico. Cuba and the United Kingdom.

EXPORTS OF IRON AND STEEL PRODUCTS FROM THE UNITED STATES

Gross Tons

Item	Jan. 1933	Dec. 1932	Jan. 1932
Pig iron	371	71	325
Ferromanganese and spiegeleisen	.....	5	5
Iron and steel scrap	31,813	30,148	7,572
Ingots, blooms, billets, slabs, sheet bars	91	7	160
Bars, iron	23	29	30
Bars, steel	1,085	1,432	1,769
Bars, alloy steel	30	74	45
Wire rods	711	1,103	1,108
Boiler plate	48	96	29
Other plate, not fabricated	292	614	1,016
Skelp, iron or steel	157	167	1,056
Iron sheets, galvanized	35	88	139
Steel sheets, galvanized	2,452	1,510	2,605
Steel sheets, black	2,557	2,309	3,390
Iron sheets, black	123	76	175
Strip steel, cold-rolled	329	382	483
Hoops, band, scroll iron or steel	615	510	1,380
Tin plate & terne plate	4,433	4,118	5,311
Water, oil, gas, other tanks, not lined	479	365	158
Structural shapes, not fabricated	581	637	792
Structural shapes, fabricated	338	568	940
Plates, fabricated, punched, shaped	12	267	18
Metal lath	52	127	89
Frames, sashes, and sheet piling	31	232	703
Rails, 50 pounds and over	2,315	267	848
Rails, under 50 pounds	5	94	317
Rail fastenings	283	64	126
Switches, frogs, crossings	19	16	105
Railroad spikes	62	30	52
Railroad bolts, nuts, washers	21	26	65
Boiler tubes, seamless	297	289	185
Boiler tubes, welded	5	11	37
Casing, oil-line pipe, seamless	906	387	827
Casing, oil-line pipe, welded	202	57	288
Seamless black pipe, other than casing	53	57	62
Malleable-iron screwed pipe fittings	112	136	117
Cast-iron screwed pipe fittings	80	67	73
Cast-iron pressure pipe, fittings	164	89	200
Cast-iron soil pipe, fittings	190	317	225
Welded black steel pipe	514	771	1,263
Welded black wrought-iron pipe	32	138	57
Welded galvanized steel pipe	802	1,425	1,316
Welded galvanized wrought-iron pipe	45	75	18
Riveted iron, steel pipe, fittings	2	3	.....
Plain iron, steel wire	184	374	381
Galvanized wire	206	357	317
Barbed wire	831	1,300	1,343
Woven-wire fencing	61	48	135
Woven-wire screen cloth	40	43	42
Wire rope	107	123	155
Other wire and manufactures	173	194	187
Wire nails	601	791	1,202
Horseshoe nails	64	76	47
Tacks	30	41	32
Other nails, staples	121	200	219
Ordinary bolts, machine screws, nuts, etc	185	307	225
Iron castings	319	564	140
Steel castings	48	69	98
Car wheels and axles	777	243	144
Horseshoes	3	2	23
Iron and steel forgings	203	226	478
Total	56,720	54,116	40,648

ORIGIN OF JANUARY IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Norway	6,950	.....	.....	2,284
Soviet Russia	6,800	.....	.....	.....
United Kingdom	36	.....	.....	110
Mexico	148	.....	.....	.....
Cuba	150	.....	34	.....
Netherlands	.....	2,069	.....	.....
Kwantung	.....	1,004	.....	.....
Canada	.....	162	.....	1,162
British India	.....	3,209	.....	.....
Hong Kong	.....	.....	1	.....
Total	14,084	6,444	35	3,556

	Steel ingots	Steel scrap	Steel bars	Cast iron pipe
Belgium	3	.....	1,263	54
Sweden	.....	34	121	.....
Canada	.....	178	.....	.....
France	.....	.....	147	.....
Germany	.....	.....	103	.....
Czechoslovakia	.....	.....	9	.....
United Kingdom	.....	.....	21	.....
Total	3	212	1,664	54

Farrell Sees Foreign Trade Revival a Necessity

In issuing the call for the twentieth national foreign trade council convention at Pittsburgh, April 26-28, James A. Farrell, chairman of the National Foreign Trade council, declares revival of foreign commerce a basic condition for recovery.

Since 1929, American export trade has declined 69 per cent in dollar value and 42 per cent in volume, while the average recession of world trade has been 60 per cent in dollar value and 37 per cent in volume.

Because in the past six months the world average has caught up with the American level and the rate of decrease has been diminishing, the council believes that the trade depression has spent its force.

Corp. Confers in South

Birmingham, Ala.—Reports of a centralized plan for subsidiaries of the United States Steel Corp. are revived, following recent conferences attended by C. F. Blackmer, Cleveland, president; D. A. Merriman, Chicago, vice president and general manager; and J. L. Perry, Cleveland, vice president, all of the American Steel & Wire Co., with H. C. Ryding, president, and other officials of the Tennessee Coal, Iron & Railroad Co.

Adjust Traffic, Ease Taxes—Is Schwab's Prescription

Charles M. Schwab, chairman of the Bethlehem Steel Corp., on celebrating his 71st birthday, Feb. 18 prescribed two basic remedies for business—an adjustment of tariffs to fit labor and monetary conditions so that the United States can compete with cheaper foreign products, and lighter taxation.

Mr. Schwab declared his continuing confidence that big business is superior to small business and restated his conviction that "things will ultimately be all right. The United States must go bounding on and on for we have youth and energy and ambition and no other nation is so endowed with the good things of God."

Is Low on Electrodes

Welding Service Inc., San Francisco, is low on welding electrodes for the Puget Sound navy yard at $4935, delivered, and $5682.50, f.o.b. works.

IMPORTS OF IRON AND STEEL PRODUCTS INTO THE UNITED STATES

(Gross Tons)

Item	Jan., 1933	Dec., 1932	Jan., 1932
Pig iron	6,444	14,244	9,369
Sponge iron	.....	22	.....
Ferromanganese, spiegeleisen (1)	3,556	999	1,559
Ferrochrome (2)	.....	42	30
Ferrosilicon (3)	4	5	8
Other ferroalloys	1	36	150
Scrap	212	.....	411
Steel ingots, blooms	3	86	1,511
Concrete bars	256	905	3,428
Hollow bar, drill steel	84	73	53
Merchant steel bars	1,664	1,711	3,817
Iron slabs	1	3	.....
Iron bars	16	44	18
Wire rods	1,196	1,149	986
Boiler, other plate	40	1	30
Sheets, skelp, saw plate	1,237	1,262	260
Tin plate	19	1	50
Structural shapes	1,673	4,166	3,779
Sheet piling	.....	.....	.....
Rails, rail fastenings	201	245	182
Cast-iron pipe, fittings	54	.....	11
Welded pipe	280	361	404
Other pipe	77	130	202
Barbed wire	1,717	521	1,325
Round iron, steel wire	155	105	147
Telegraph, telephone wire	16	3	2
Flat wire, strip steel	65	91	71
Wire rope, strand	127	146	139
Other wire	225	123	84
Hoops and bands	1,445	1,777	2,034
Nails, tacks, staples	1,007	1,051	800
Bolts, nuts, rivets	20	26	18
Horse, mule shoes	35	29	4
Castings, forgings	52	33	171
Total	21,892	29,390	31,053

(1) Manganese content.
(2) Chromium content.
(3) Silicon content.

Financial News of Steel Industry

SHARON STEEL HOOP CO., Sharon, Pa., and subsidiaries, report a net loss of $2,016,269 for 1932 after depreciation, interest and other charges. By comparison net loss was $1,396,995 in 1931.

□ □ □

Allegheny Steel Co., Brackenridge, Pa., reports a net loss, after charges and depreciation, of $1,052,080 for 1932. This compares with net income, after depreciation, of $50,228 for 1931, equal to $1.50 a share on the 7 per cent cumulative preferred stock, of which there are 33,426 shares.

□ □ □

Superior Steel Corp., Pittsburgh, reports net loss of $600,273 during 1932. In comparison, 1931 net loss was $492,372.

□ □ □

Shepard-Niles Crane & Hoist Corp., Montour Falls, N. Y., reports net loss of $380,583 in 1932, compared with loss of $346,802 in 1931. This is after charges.

□ □ □

Midland Steel Products Co., Cleveland, encountered a net operating loss of $221,295 in 1932. Current assets Dec. 31 were $6,320,885, and current liabilities $239,246.

□ □ □

Western Pipe & Steel Co. of California, Los Angeles, reports net profit of $50,777, after depreciation, charges and preferred dividend requirements, in 1932, compared with a profit of $767,330 in 1931.

□ □ □

Mesta Machine Co., Pittsburgh, has declared the regular quarterly dividend of $1.50 on preferred, payable April 1 to record March 16 and in addition a quarterly dividend of 15 cents on the common as against 25 cents previously.

□ □ □

Harbison-Walker Refractories Co., Pittsburgh, reports net loss of $609,952 in 1932 compared with net income of $1,284,344 in 1931. Deficit after dividends was $960,468 in 1932, comparing with deficit after dividends of $55,656 in 1931.

□ □ □

Electric Controller & Mfg. Co., Cleveland, shows on its balance sheet current assets of $1,277,140 and current liabilities of $42,852, or a ratio of more than 29 to 1. The 1932 net loss was $369,889, of which $55,693 represented depreciation and $52,115 development.

□ □ □

McKeesport Tin Plate Co. and Tin Plate Improvement Co., McKeesport, Pa., show a net profit of $1,503,088, after charges, in 1932. In 1931 the net profit was $1,952,028. Both years include the company's share of earnings of the Metal Package Corp.

□ □ □

Arthur G. McKee & Co., Cleveland, shows net profit in 1932, after charges, of $265,079, contrasted with profit of $555,118 in 1931. Current assets on Dec. 31 totaled $680,904, including $544,200 in cash and government securities. Current liabilities were $97,447.

Review Status of Stainless Steel at Joint Meeting

Development of stainless steels, available types, uses and applications were considered at a joint meeting in Philadelphia, Feb. 23, of the local chapters of four national engineering groups—American Institute of Architects, American Society of Mechanical Engineers, American Society for Steel Treating and American Welding society.

Dr. M. A. Grossmann, research engineer, Illinois Steel Co., Chicago, himself a pioneer in the metallurgical development of corrosion-resisting steels in this country, traced the progress made by these steels since their introduction. (See STEEL, Feb. 13, p. 28).

D. T. Haddock, consulting engineer, American Sheet & Tin Plate Co., Pittsburgh, who for the past five years has been actively engaged in development and promotion of corrosion-resisting steels, detailed some of the prominent uses to which these steels have been adapted. Further digest of Mr. Haddock's remarks will appear in an early issue of STEEL.

A special feature of the meeting was an interesting exhibit of stainless steel products, presented in classified displays through courtesy of producers and fabricators of the material.

Shows Japan Continues Large Buyer of Scrap

Out of 227,495 tons of scrap exported from the United States in 1932, approximately 164,000 tons or 72 per cent went to Japan, Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel, New York, pointed out at a recent meeting of the New York chapter.

In this movement to Japan, New York is the leading port. Mr. Schwartz estimated that since Jan. 1 orders for approximately 160,000 tons of scrap to be shipped chiefly from eastern markets have been placed by Japan, Italy and Poland.

Business News Of Washington

COMMERCIAL ATTACHE COOPER, at London, has cabled the department of commerce that increased duties on imports of certain iron, steel and wire products into the United Kingdom will be effective March 28.

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Examiner Charles Fowler, of the interstate commerce commission, has reported that excess net railway operating income of the Duluth & Iron Range railroad, a subsidiary of the United States Steel Corp., for the period March 1, 1920 to Dec. 31, 1920, subject to recapture was $674,805.

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The treasury department has issued an order that it has been found that there is no dumping ammonium sulphate from The Netherlands and appraising officers are authorized to appraise such imports from The Netherlands without regard to any question of dumping.

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Reconstruction Finance Corp., which up to Jan. 31 had advanced a total of $1,788,666,000, of which repayments have totaled $347,237,000, will purchase $600,000 of bonds of the Regional Bridge Co., Kansas City, Mo., for constructing a toll bridge across the Missouri river at Kansas City, Kans. It is estimated that 2500 tons of structural steel will be required.

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R. E. Flanders, manager, Jones & Lamson Machine Co., Springfield, Vt., at the hearing of the senate finance committee on the economic situation said that he favored control of the hours of labor on goods entering into interstate commerce and advised a tax on incomes to provide a subsistence wage for unemployed rather than the possibility of industrial insurance, which he stated would be disastrous.

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During December only 1846 immigrants came into the United States, according to the bureau of immigration.

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The house committee on labor has made a favorable report on the bill providing for a 5-day week and a 6-hour day.

Byers Resumes at Ambridge

A. M. Byers Co.'s plant at Ambridge, Pa., resumed operations Feb. 17 after three months' idleness.

DETROIT

AFTER sober second thought on its bank moratorium, which is in process of being revised to permit approved withdrawals proportionate to the liquid assets of the various banking institutions, Detroit concedes sadly that the day of judgment is at hand.

For exactly 25 years, dating the automobile industry from the time Henry Ford put Model T in quantity production, the city has been carried along on the crest of an enormous wave—a wave which early engulfed the placid, conservative Detroit founded on drugs, freight cars, stoves, chemicals, paint and lumber, and swept a new and younger generation into the driver's seat.

The automobile having captured the public imagination and the standard of living being on a sharply rising curve, the momentum generated by the new industry was irresistible; a plunging enthusiasm was instilled; and for all practical purposes few knew until 1929 that there was a reverse gear in the transmission.

Auto Industry a Pioneer

A blanket indictment cannot justly lie against the entire automobile industry or Detroit. Few industries have been so progressive or have contributed so much to the national well being. A prodigious amount of pioneering has been done in Detroit. A new technique in production and management has been evolved amid the turbulent upbuilding of a new industry.

But a thin veneer of leadership so garish that it connoted Detroit to many persons sprang up. Here snap judgments became the fashion; million dollar mistakes were tolerated because they would be washed out in the course of a year; one eye frequently was on the ticker tape; more than once was a profit of a million turned in one month; speculative fortunes were invested in real estate; there was a disdain for the older, plodding industries which had long since emerged from reckless adolescence into maturity.

It was great—while it lasted. Now this wave has broken and Detroit is struggling in the undertow. Successively in 1929, 1930, 1931 and 1932 men and fortunes were sucked back into the depths, and at this time the banking crisis is summoning the remainder.

What passed as leadership is being revealed as merely aggressive opportunism. The mature, deliberate judgment bred by a long background of finance in New York, iron and steel in Pittsburgh, iron ore and coal in Cleveland, and a diversity of industry in Chicago is conspicuously lacking.

The specialists who have been consulting at the bedside of Detroit's financial institutions the past two weeks have been largely from these cities, to the chagrin, especially, of the remnants of the older aristocracy in banking and industry. Against the invader the old and the new in Detroit are presenting a unified front. The prospect is that the prescription for Detroit will be written by outsiders but filled locally by a conservative element now enabled to break through.

Detroit's banking problem has been peculiar. Because the automobile industry is operated on a strictly cash basis, cars being paid for by dealers at the end of the assembly line, it has never been a great borrower. Hence surplus banking funds have naturally gravitated toward real estate. Fire plugs and paving in rural allotment girding Detroit are memorials to a now-forelorn hope for unceasing prosperity and growth. The pivotal bank in the present disturbance is understood to have approximately 72 per cent of its assets in real estate—which tells all. There is no little opinion that much of the shrinkage in real estate assets will never be recouped.

Conservatism Is Emerging

Detroit, of course, will work out of this situation, just as surely as the automobile will survive this depression. But it will be a new Detroit. Under the veneer of so-called leadership which three years of depression has warped and buckled is an underlay of chastened judgment which promises less hurried counsel, a pace geared more closely to the remainder of the country and an understanding of the problems of the older industries supplying materials to automobile and parts manufacturers.

The banking situation is being handled with skill. The precipitate

A New Technique in Firing!

ON A RECENT afternoon, at about 4 o'clock, the assistant manager of an important department of a large industrial establishment in Detroit walked into his chief's office.

"I have just been instructed to inform you that you are dismissed and I am the new manager," said the assistant.

"I'll check on that," said the manager grimly, reaching for his telephone.

"No, you won't," rejoined the assistant, "my instructions also are that you are not to use the phone or touch any papers in or on your desk. The cashier will have a check for you tomorrow."

"But I have some personal matters in my desk," protested the now ex-manager.

"If so, a messenger will deliver them to you, but this desk and office are the property of the —— company and only company business was supposed to have been transacted here."

Thus ended ten years of service of this department manager.

failure of any institution has been averted by the holiday; two strong institutions are being further strengthened with fresh capital; there will be an orderly thawing or elimination of frozen assets; future business is being insulated against any connection with the past.

None of the larger automobile or parts makers has been placed in special jeopardy by the banking crisis. The larger consumers of iron, steel and other materials continue to experience no special difficulty in obtaining their requirements.

But the smaller manufacturers, especially those buying c.o.d. or sight draft, are increasingly inconvenienced. As it becomes apparent that Detroit will be a long time working completely out of the banking disturbance there is a more noticeable tendency in all business to slow down.

Incidentally, the course of events since late 1932 has been adverse to the parts manufacturers not allied with Chevrolet, Pontiac, Dodge and Plymouth, and to a leser extent Ford. The first four of these manufacturers have accounted for over 80 per cent of all 1933 models assembled thus far. In regard to castings, stampings and other parts these four are practically self-contained. Hence the unallied parts interests have not shared in the rise in motor vehicle assemblies in December, in January and early February.

Production Is Slowing

Whether it is due wholly to the sharp contraction of retail demand for automobiles in Michigan and nearby sensitive territory is too early to appraise, but the trend of automobile production is now distinctly downward. The February total will not vary greatly from the 120,000 to 125,000 units of January, but if anything the month will be on the down side. Releases of material for March shipment are comparatively meager.

It is impossible for Ford to turn the tide in February, and while the opportunity exists for March, there is no present indication of a large program at Fordson. Current production of the larger eight, recently introduced, is not over 1000 units a week, no sales promotion campaign has been launched, and surface indications still point to a conservation of cash.

Preliminary work on the new Model 44, the small job to be priced at about $350 and to be the Ford trump card in the extremely low price field, appears to have slackened. It had been understood that the four-cylinder engine, with some improvements, would be continued only in commercial bodies, but it is announced that the new streamline 112-inch chassis can be had with a four as well as a V-eight, at $50 less than the price of the new eight.

Incidentally, the early unfavorable opinion concerning Mr. Ford and his part in the banking crisis has been dissipated and there is a transfer of recrimination to the opposition which blocked a Reconstruction Finance Corp. loan at Washington.

Chevrolet has slowed its schedule perceptibly the past week and will fall short of its goal of 55,000 to 60,000 Chevrolets, 12,000 Pontiacs and a substantial bank of certain parts for the new Mercury. Practically all Chrysler units also are operating on a more modest scale, and releases for March are light. Hudson-Essex, however, has been operating five days a week on a weekly total of 1200 units, mostly Terraplanes.

Ford Steelworks Sold?

One phase of the present readjustment in Detroit is a series of subterranean fears that more control of local industries will pass to the East.

General Motors divisions are autonomous in many respects, yet the last word is spoken in New York. The same is true of Chrysler.

Local capital and pride built the Michigan Steel Corp. and the Great Lakes Steel Corp., but both now are divisions of the National Steel Corp., of Pittsburgh.

In case the program of the Ford Motor Co. of disassociating itself from many of its manufacturing enterprises should extend to its steelworks, no raw steel capacity would be left to local control.

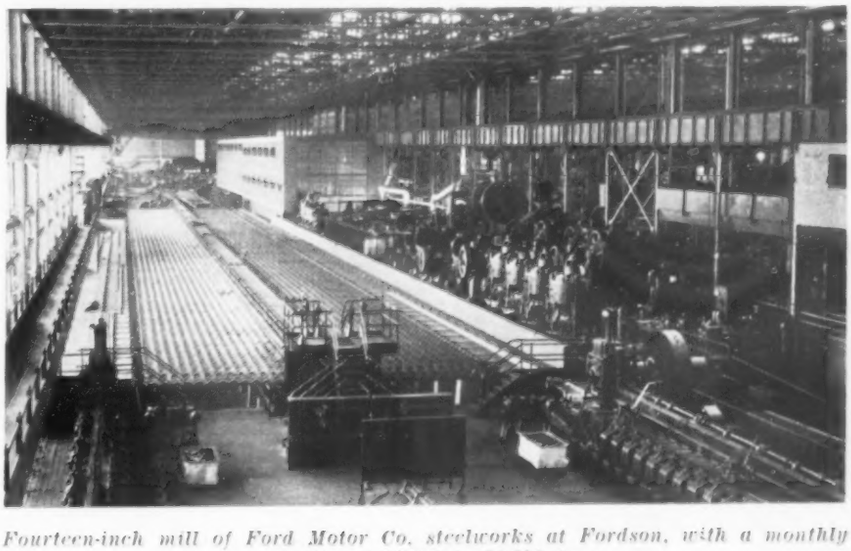
The Ford venture in iron and steel includes two blast furnaces, 10 open-hearth steel furnaces and appropriate auxiliaries, with an annual capacity of 375,000 tons of pig iron, 520,000 tons of steel ingots and 1,350,000 tons of by-product coke. There also are upper lake iron ore properties and lake freighters.

Rolling mill equipment consists of a continuous blooming mill, an 18-inch continuous bar mill, a 14-inch spring mill, a 14-inch rod mill and a wire-drawing mill. The nucleus of a well-rounded steel unit is available at Fordson.

White Motor Co. has booked 12 heavy-duty trucks and trailers for the Iraq Petroleum Co., for transporting pipe for the new Iraq pipeline in the Near East . . . . White also announced a diesel-powered truck in the Indiana line, featuring dustproof enclosures, removable cylinder liner, interchangeable bearing shells and built-in governor . . . . The Michigan legislature is considering a 3 per cent retail sales tax and a 3/10 of 1 per cent levy on manufactured products, which would make a total of 10½ per cent federal-state taxes on retail sales in the state . . . . Automobile retail sales in January are estimated at 90,000, compared with 87,000 in January, 1932 . . . . The proportion of current state and local rural highway revenue derived from motor vehicle license and fuel taxes in 1930 was 55.4 per cent, made up of 22.6 per cent from license taxes and 32.8 per cent from fuel taxes, according to the National Industrial Conference board.

E. T. Weir To Address Pittsburgh Traffic Club

The Traffic Club of Pittsburgh holds its thirty-second annual dinner at the William Penn hotel, Pittsburgh, March 9. E. T. Weir, chairman of the board, National Steel Corp., Pittsburgh, will deliver the principal address. Industrialists and business leaders from all parts of the country are expected to attend. C. W. Gottschalk, Jones & Laughlin Steel Corp., Pittsburgh, is chairman of the dinner committee.



Fourteen-inch mill of Ford Motor Co. steelworks at Fordson, with a monthly capacity of 15,000 to 20,000 tons

Industrial Men in the Day's News

Col. W. C. Allen, Chairman, and W. Gibson Carey Jr., President, Yale & Towne Mfg. Co.

Col. W. C. Allen

YALE & Towne executives mount the ladder as Schuyler Merritt goes to the house of representatives at Washington.

COLONEL Allen leaves the presidency after 17 active successful years. Long-deferred recreation now becomes possible.

TO the presidency Mr. Carey brings a successful record of sales and financial direction. He was captain of artillery in France.

—Pack Bros. Photo

W. Gibson Carey Jr.

W GIBSON CAREY JR., recently named president of the Yale & Towne Mfg. Co., New York, started with the company as assistant to the president. Other steps in his rise to the chief executive office included the vice presidency and the post of treasurer. He succeeds Col. W. C. Allen, who becomes chairman of the board.

These changes in the high offices of the company follow the resignation of Schuyler Merritt, member of congress, whose retirement from active participation in the affairs of the company allows him to devote his entire time to congressional duties, residing at Washington. He remains a director of the company.

President Carey, a native of Schenectady, N. Y., the son of parents of southern ancestry, is a graduate of Union College. Previous to becoming affiliated with the Yale & Towne Mfg. Co., Mr. Carey was general manager of the Philadelphia division, Container Corp. of America, and for several years before serving with the Container Corp. of America was secretary-treasurer and sales manager of the Philadelphia Paper & Mfg. Co., the latter company merging with the Container Corp.

Mr. Carey came to Yale & Towne with a record as a leader in organization and executive ability. He served as captain of artillery in France during the World war. His long and successful training, especially in the sales distribution and financing ends of the business, will prompt him to continue to concentrate on these branches of the business.

Colonel Allen, the new chairman, became president of the company 17 years ago, after starting with the organization as a boy in the shop and working his way through the various departments to that position. In relinquishing the more strenuous duties as president, Mr. Allen will devote more time to deserved recreation.

For more than 54 years, Congressman-elect Merritt has been connected with the Yale & Towne organization, being chairman for the last eight years and for 46 years either as secretary or vice president. He has previously served in congress from Connecticut.

WILLIAM H. WOODIN, president of the American Car & Foundry Co. and American Car & Foundry Export Co., chairman of the American Locomotive Co., American Car & Foundry Motors Co., Brill Corp. and Railway Steel Spring Co., and member of board of the Remington Arms Co., Superheater Co., Montreal Locomotive Works and American Ship & Commerce Co., among other interests, on March 4 becomes secretary of the treasury in the cabinet of President Franklin D. Roosevelt.

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Philip M. Guba, who has been assistant manager of sales of the Republic Steel Corp. in New York since the formation of that company by merger in 1930, has been appointed assistant manager of sales in Detroit by the Carnegie Steel Co., subsidiary of the United States Steel Corp., effective March 1. Mr. Guba for many years was with the Jones & Laughlin Steel Corp., Pittsburgh, and the Donner Steel Co., Buffalo, and was eastern sales manager of the latter company when it was absorbed by Republic in 1930.

Howard Clark, formerly with the Great Lakes Steel Corp., Detroit, has been appointed junior assistant manager of sales at Detroit for the Carnegie Steel Co. Thus the Carnegie organization in the Detroit district will have two assistants to Wiliam B. Weston, district manager of sales.

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George W. Putnam, formerly open-hearth superintendent at the Butler, Pa., plant of the American Rolling Mill Co., has been named open-hearth superintendent of the Youngstown, O., division of the Republic Steel Corp.

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Coolidge Sherman, who has been associated with the Ludlum Steel Co., Watervliet, N. Y., since his graduation from Yale in 1916, recently being assistant to the president, has been appointed assistant general sales

manager of the company. Previously he had been assistant manager of sales and district sales manager at Cleveland. Mr. Sherman has devoted the major portion of his time to the promotion of the stainless steels and heat-resisting alloys of the company.

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J. E. Duncan, formerly of the Detroit office of the Empire Steel Corp., is now operating a warehouse for cold-drawn bars at 907 Harper avenue, Detroit.

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T. C. Eibell has resigned as manager of advertising and publicity of the Worthington Pump & Machinery Corp., New York, a post he has held for the past four years.

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Rudolph Furrer, formerly chief engineer and director of research of the A. O. Smith Corp., Milwaukee, has become assistant to all operating vice presidents of the National Tube Co., Pittsburgh.

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George W. Fuller, consulting engineer of Fuller & McClintock, New York, and nationally known hydraulic and sanitary engineer, has been elected chairman of the Engineering Foundation, New York.

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Walter W. Trout, district manager at Tulsa, Okla. for Lufkin Foundry & Machine Co., Lufkin, Tex., has been transferred to Dallas, Tex., where he will have charge of sales in the Mid-Continent district. He will be located in the Magnolia building.

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Alton Farrel, connected with the Farrel-Birmingham Co. Inc., Ansonia, Conn., for 30 years and treasurer for 20, has resigned as treasurer and director on account of illness. Frederick M. Drew Jr. was elected treasurer and director in his place.

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Patrick Dwyer, engineering editor of *The Foundry*, Cleveland, was the principal speaker, Feb. 23, before the St. Louis Foundrymen's club, St. Louis. He discussed various phases of the technical and business problems encountered in the foundry industry today.

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O. L. Hollister was re-elected president-treasurer of the Federal Malleable Co., West Allis, Milwaukee, at the recent annual meeting. William A. Draves was elected vice president in place of C. R. Messinger, and William J. MacNeill secretary in place of L. S. Peregoy. Messrs. Messinger and Peregoy and E. L. Wood and William C. Frye were re-elected directors. Newly elected directors are Albert W. Draves and Linus Krebs.

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Charles A. Fisher, former president of Jones & Laughlin Steel Corp., Pittsburgh, has been chosen president of a new bank being formed in Pittsburgh supplanting the closed Diamond National and Monongahela National banks. On the tentative list of directors are James O. Carr, vice president, Allegheny Steel Co.; T. J. Gillespie, president, Lockhart Iron & Steel Co.; Harry C. Graham, vice president, Pittsburgh Screw & Bolt Co.; R. M. Dravo, vice president, Dravo Contracting Co.; and Mr. Fisher.

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J. W. Wilson, for 20 years with the Link-Belt Co., Chicago, is now connected with the sales and engineering organization of McNally-Pittsburg Mfg. Co. at 205 West Wacker Drive, Chicago. The latter company designs and manufactures coal preparation machinery, coal tipples, coal washeries and material handling equipment. Mr. Wilson has been prominent in the designing of coal tipples, cleaning and preparation plants and goes to the McNally-Pittsburg Mfg. Co. in the same capacity.

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Byron E. Helper has been elected president of the Hope Engineering Co., Mt. Vernon, O., to succeed the late Raymond S. Lord.

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Thomas Redmond was elected president of the Cadillac Machinery Co., Fisher building, Detroit. Other officers chosen at the recent annual stockholders meeting were Kennedy H. Crumrine, vice president; Edward Busch, treasurer, and Frank Donovan, secretary. Messrs. Redmond, Crumrine and Busch and Colin L. Campbell and Charles Robertson were elected directors.

Here and There In Industry

CHICAGO STEEL SERVICE CO., Chicago, has appointed David W. Devine, 505 North Water street, Milwaukee, its representative in Wisconsin. Chicago Steel Service Co. is distributor for Republic Steel Corp., Youngstown, O., for its Toncan iron sheets and Enduro stainless steel sheets and bars.

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Binghamton Flexible Shaft Co., Binghamton, N. Y., suffered loss of its plant and contents by fire recently. Rebuilding will be undertaken immediately for continued production of its line of portable electric grinders, tools and equipment.

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Milcor Steel Co., Milwaukee has purchased the Richsto Metal Trim Co., Aurora, Ill., manufacturer of metal trim and base for public buildings, rounding out its line of fireproof building products. Equipment is being moved to the Milwaukee plant and O. C. Yaecke, general manager of the Richsto company, will manage the metal trim division.

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Bridgeport Machine Co., Wichita, Kans., manufacturer of oilfield drilling equipment, has established a branch store and warehouse at Conroe, Tex., in charge of John Weston, formerly with the company at Oklahoma City, Okla.

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Fort Worth Steel & Machinery Co., Fort Worth, Tex., manufacturer of farm machinery and oilfield equipment, has entered the power machinery field and is manufacturing elevating, conveying and power transmission machinery. J. L. Jackson is president and general manager.

Obituaries

ALBERT A. WEISS, 43 Pittsburgh district sales manager for Harbison-Walker Refractories Co., Pittsburgh, died at Pittsburgh, recently. He had been affiliated with the company for 26 years and after serving in various duties he became a sales representative in that district. A few years ago he was made district sales manager.

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Daniel I. Whittelsey, president, Oil Transfer Corp., New York, died Feb. 4.

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J. E. Irwin, 60, master mechanic and purchasing agent, Sand Springs Railway Co., Sand Springs, Okla., died Feb. 19.

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John L. Kennedy, 65, engineer, for many years identified at Chicago with the Grinnell Co. Inc., Providence, R. I., died in Chicago, Feb. 21.

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James B. Wilbur, 51, assistant secretary of the Stanley Works, New Britain, Conn., prior to his retirement in 1929, died in New York, Feb. 21.

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Allen R. Rea, 77, for 25 years export manager of Fairbanks, Morse & Co., Chicago, died Feb. 22 at his home in Hinsdale, Ill. He retired in 1927.

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James H. Jowett, 58, executive vice president of the Ingersoll-Rand Co., New York, died Feb. 17. He had spent his entire business career with the Ingersoll-Sergeant Drill Co. and its successor, the Ingersoll-Rand Co.

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George A. Vogel, 68, until 1926 with the Black Diamond mill of the Crucible Steel Co. of America, died at Pittsburgh, Feb. 19. During part of his identification with the Crucible Steel Co., which lasted over 43 years, he served as superintendent.

EDITORIAL

Toll of Rust, Wear and Tear Exceeds Output of Steel

SIR ROBERT HADFIELD, English scientist and steelmaker whose contributions to the metallurgical industries are well known on this side of the Atlantic, has called attention to an extraordinary situation in the production and consumption of steel that has resulted from the present financial crisis.

Writing in the trade and engineering supplement of *The Times* (London), Jan. 28, 1933, Sir Robert emphasizes the fact that the loss of steel by corrosion, wear and tear is greater than current production. He estimates that steel taken out of use throughout the world in 1932 amounted to 67,000,000 tons. World production of steel ingots and castings in 1932 was 49,160,000 tons, according to STEEL's annual compilation (page 82, Jan. 2, 1933). Of this amount about 1,100,000 tons were steel castings and the remaining 48,000,000 tons were ingots, which would account for approximately 34,400,000 tons of finished rolled steel. Thus, the world total of finished rolled and cast steel in 1932 was roughly 35,500,000 tons.

Production in Past Two Years Was Less Than Losses Through Corrosion, Wear and Tear

Therefore on the basis of Sir Robert's estimate, actual world production in 1932 was 31,500,000 tons short of ordinary requirements for replacements. By similar computation, it is found that a corresponding deficiency of 15,500,000 tons occurred in 1931. This means that for at least two years the amount of steel in service actually has decreased. Until 1931 and 1932, nothing even remotely approaching this extraordinary situation had been witnessed in the 60 years of steel's reign as an important material!

Sir Robert's figure of 67,000,000 tons annual loss through corrosion, wear and tear is roughly 5 per cent of the estimated total tonnage of steel in service in the world. By applying this percentage to estimates of steel in use in the United States, it is possible to construct an interesting picture of the relation of current consumption and production in this country.

In 1926, Frank N. Speller, in his book "Corrosion—Causes and Prevention," stated that "in 1924 there were about 450,000,000 tons of all kinds of rolled iron and steel products in service in the United States." Using this figure as a base, and excluding steel castings in order to simplify the computation, we find that at the end of 1930 the total of finished rolled iron and steel in service was about 510,000,000 tons. This figure was determined by adding to the base the actual production of each year and subtracting the 5 per cent loss due to corrosion, wear and tear.

The computation from the end of 1928 to date is as follows:

		Gross Tons
Finished rolled iron and steel in service at the end of 1928		493,126,000
Production, 1929	41,069,000	
Loss, 1929	26,700,000	
Net gain	14,369,000	14,369,000
In service at end of 1929		507,495,000
Production, 1930	29,513,000	
Loss, 1930	26,850,000	
Net gain	2,663,000	2,663,000
In service at end of 1930		510,158,000
Production, 1931	19,175,000	
Loss, 1931	26,450,000	
Net deficit	7,275,000	—7,275,000
In service at end of 1931		502,883,000
Production, 1932	10,000,000	
Loss, 1932	25,600,000	
Net deficit	15,600,000	—15,600,000
In service at end of 1932		487,283,000

On the basis of the foregoing the combined deficit in 1931 and 1932 is greater than the total output of finished rolled steel in 1931. At the January, 1933, rate of production, a further deficit of 17,870,000 tons for 1933 would be indicated.

Of acourse the above calculation represents only a rough approximation. The base figures are only estimates and the 5 per cent factor used may be somewhat high or low. However, even allowing a liberal margin for error, it is clear that the present demand for steel is far below the bare replacement requirements.

The figures lend strength to the belief, stated many times in these columns, that when the restricting influence of financial distress is lifted from this nation and from the other industrial countries of the world, demand for steel will rise not only because of the resumption of normal current needs but also to make good the deficiencies incurred during the present period.

THE INDUSTRIAL DIAL

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The Business Trend Section of STEEL
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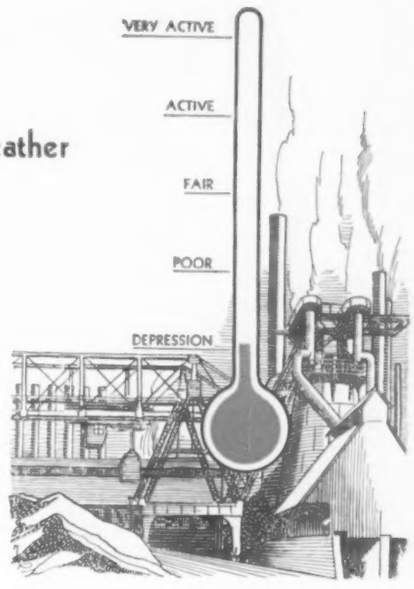
FEBRUARY brought forth more than one short month's share of disconcerting news, yet in spite of that fact, business displayed a degree of stamina that is decidedly encouraging.

The Michigan bank situation, unfavorable annual reports of many important companies, increasing revolt against mortgage and other debt burdens, fresh revelations of past follies and in some cases dishonesty in banking and financial transactions, and many other unfavorable factors might have been expected to affect business seriously. However, while the uncertainty arising from these developments unquestionably has retarded the first-quarter recovery of business, the weekly statistics indicate that in many respects February volume is running slightly ahead of that of January.

Weekly estimates of the rate of steelworks operations point to a monthly average of around 19 per cent for February as compared with 17.78 per cent in January. Revenue freight car loadings recovered after a dip in the first few days in February and probably will continue in sufficient volume throughout the remainder of the month to lift the weekly average above that of January. In the week ending Feb. 11 soft coal output shot up more sharply than in any week since early in March, 1932. Power output, which had slipped slightly for several weeks, turned upward in the second week of February. Automobile output for February, which up to two weeks ago gave promise of exceeding the total of January, now shows signs of falling slightly behind the January figure, due to interruptions by wage disagreements, effect of the bank holiday and to a seasonal tapering off of first-of-the-year demand.

The monthly commodity price indexes for Feb.

Industrial Weather



TREND:
Mildly Upward

The Barometer of Business

Industrial Indicators

	Jan., 1933	Dec., 1932	Jan., 1932
Pig iron output (Daily average, tons)	18,348	17,650	31,336
Machine Tool Index	33.1	31.7	59.2
Unfilled orders (tons)	1,898,644	1,968,140	2,648,150
Ingot output (Daily average, tons)	38,704	32,485	56,133
Dodge Bldg. awards in 37 states (sq. ft.)	8,453,000	6,948,700	12,600,000
Automobile output	*115,915	109,542	123,000
Coal output, tons	27,093,000	31,110,000	27,892,000
Business failures, number	2,919	2,469	3,458
Business failures, liabilities	$79,100,602	$64,188,643	$96,860,205
Cement production, Bbls.	.....	4,248,000	4,989,000
Cotton consumption, bales	471,000	440,100	435,337
Car loadings (weekly average)	517,900	497,366	554,640

*Estimated.

Foreign Trade

	Jan., 1933	Dec., 1932	Jan., 1932
Exports	$120,000,000	$136,000,000	$150,022,000
Imports	$96,000,000	$97,000,000	$135,520,000
Gold exports	$14,000	$13,000	$107,863,000
Gold imports	$128,465,000	$101,872,000	$32,905,000

Financial Indicators

	Jan., 1933	Dec., 1932	Jan., 1932
25 Industrial stocks	$90.50	$89.54	$116.09
25 Rail stocks	$22.48	$20.58	$29.78
40 Bonds	$66.60	$64.05	$67.14
Bank clearings (000 omitted)	$19,949,176	$20,738,986	$26,158,938
Commercial paper rate N. Y. (per cent)	1½	1½	4
*Commercial loans (000 omitted)	$12,935,000	$10,297,000	$7,259,000
Federal Reserve ratio, per cent	65.6	63.0	65.8
Railroad earnings	$32,856,895	$34,179,119	$21,263,164
Stock sales, N. Y. stock exchange	18,719,502	23,208,129	34,342,456
Bond sales, par value	$263,030,600	$249,204,450	$292,924,800

*Leading member banks Federal Reserve System.

Commodity Prices

	Jan., 1933	Dec., 1932	Jan., 1932	Av. 1913
STEEL's composite average of 14 iron and steel prices	$28.68	$28.93	$29.98	$26.32
Bradstreet's index	$6.53	$6.79	$7.52	$9.21
Wheat, cash (bushel)	66c	63c	73c	92c
Corn, cash (bushel)	40c	41c	52c	51c
Petroleum, crude (Bbl.)	42c	67c	75c	$2.50

	Per cent
January, 1933	33.1
December, 1932	31.7
January, 1932	59.2

1 showed that all of the gains for the last half of 1932 had been eliminated in the declines of the past three months. However, weekly indexes in February have indicated resistance to the downward trend. Several of the weekly price barometers have registered fractional gains since Feb. 1.

Everything considered, business is holding its own remarkably well. With the approach of March and particularly the inauguration of a new President and a new administration, industry may entertain reasonable hope that the psychological effect of the change may produce a wholesome stimulus to business sentiment.

Where Business Stands

Monthly Average, 1932 = 100

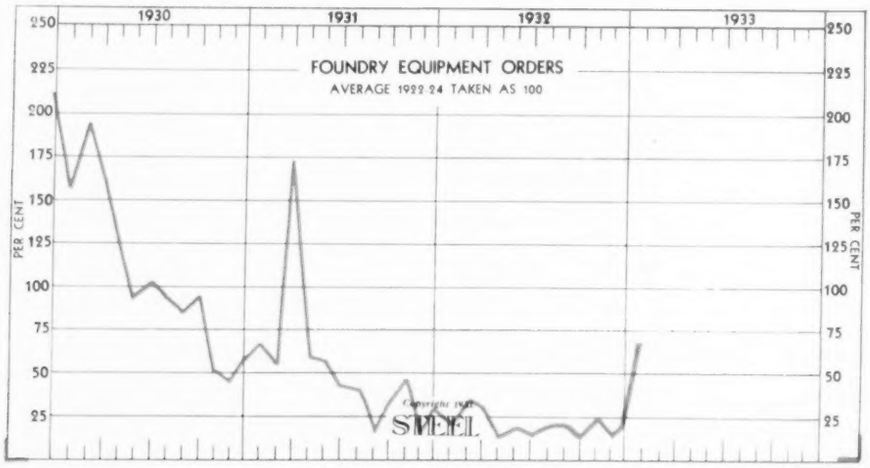
	Jan., 1933	Dec., 1932	Jan., 1932
Steel Ingot Output	92.2	77.4	133.9
Pig Iron Output	77.4	74.4	132.2
Freight Movement	95.3	91.5	101.1
Building Construction	65.0	53.4	96.9
Automobile Output	97.1	91.8	103.1
Wholesale Prices	92.0	95.6	105.9

Machine Tool Demand Continues To Show Slight Increase

The index of machine tool orders as compiled by the National Machine Tool Builders association reveals slight gain in January. The three-month moving average for the first month of this year was 33.1 compared with 31.7 in the preceding month and 59.2 In January, 1932. The shipment index was off slightly from 32.3 in December to 26.0 in January and compares with 46.7 in January, 1932. Unfilled orders gained from 45.4 in December to 48.6 for January.

Foundry Equipment Orders Up Sharply in January

Foundry equipment demand registered a sharp increase in January, according to the monthly report of the Foundry Equipment Manufacturers' association. The index for gross orders during the month was 68.4, which compares with 18.6 in December and 20.5 in January, 1932. There were no cancellation of orders reported during the January period. The shipment index for January was 23.2 which compares with 24.7 in December and 28.8 in January a year ago.



January, 1933	68.4
December, 1932	18.6
January, 1932	20.5

Cost Cut on Motor Job by Electric Brazing

By A. FINKENSTEIN
Head Construction Foreman, and
M. W. BREWSTER
Arc Welding Specialist
General Electric Co.,
New Haven, Conn.

Fig. 1—Electric resistance brazing equipment is fully portable. The operator here is making a braze on a cable with special open-hook type tongs

ELECTRIC resistance brazing recently effected a reduction in brazing time of 75 per cent on the installation of four large sets of amortisseur windings on synchronous motors. The usual method employed in the field has been to use an oxyacetylene torch. Brazing the amortisseur winding for the first of these four motors was done by this method. Since in outside work it is often undesirable to remove the field coils completely, these coils had to be packed with wet asbestos to prevent damage to the insulation when an oxyacetylene torch was used. It then required considerable time to bring the copper of the amortisseur winding to brazing temperature because of the high heat conductivity of the copper and, also, because the copper in turn was embedded in the mass of steel forming the pole piece. At best it is an involved procedure although perfectly satisfactory results can be obtained by a skilled oxyacetylene operator on this type of brazing assembly work.

With the pole pieces delivered to the welder assembled, it required 16 man hours to prepare the coils of the first machine and to oxyacetylene braze them.

Electric resistance brazing equipment was readily available since it was used frequently on bus bars, transformer connections, etc., by the local construction force. The use of this equipment suggested itself as a ready means of speeding up work on the remaining three motors. The time was thus reduced to 4 man hours per motor, a saving of 75 per cent in man hours.

In this particular instance the comparison of man hours did not represent the total saving realized, because for the oxyacetylene job a skilled welding contractor was employed at $4.50 per hour. This charge included the welder's time plus the charges for gases and use of the equipment. For electric resistance brazing, on the other hand, it is possible to employ practically any available helper. Under these conditions, the saving on this job by electrically brazing all four motors instead of oxyacetylene brazing them would have covered the purchase price of a standard electric brazing outfit such as was used on the last three machines and as shown in Fig. 3. Figures shown in

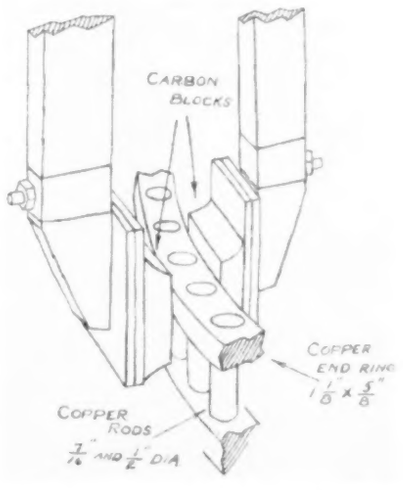


Fig. 2—Relative position of brazing tongs in making braze on amortisseur winding of synchronous motor

Comparison of Brazing Methods

(Per motor—96 brazes)

	Oxyacetylene	Electric Resistance	Saving, per cent
Labor, man hours	16	4	75
Silver solder, ounces	32	32	None
Cost of heat energy	$9.00 (gases, av.)	$0.35 (power, av.)	96

the table above outline the actual savings applying to this particular job. The amount of labor required makes it possible to compare the two processes. Less actual labor, unquestionably, would have been required if the work had been done in a well equipped shop rather than in the field. In justice to the oxyacetylene process it also should be pointed out that, if conditions were such that removal of the field coils were practicable, which it often is, the ratio of oxyacetylene to electric resistance man hours might have been reduced from 16 to 4 to something between 8 and 12 to 4, particularly if a supplementary heating flame were used in addition to the torch flame.

Each motor had sixteen pole pieces and there were six rods per pole piece. Two rods in each pole piece were 7/16-inch in diameter, and four were ½-inch in diameter. The end rings were 1⅛ inches wide by ⅝-inch thick, the holes for the rods being through the ⅝-inch thickness. End rings and rods were made of copper. The difference in brazing time of ½ to 7/16-inch diameter rod may be neglected. There were, therefore, 96 brazes per machine. Sixteen man hours divided by 96 brazes is 0.167 hour or 10 minutes per braze average, using the oxyacetylene process; and 4 man hours divided by 96 brazes is 0.042 hour or 2.5 minutes per braze using the electric resistance method. The above average time includes the preparation of the parts, the actual brazing time and rest periods.

Packing Is Avoided

In the case of oxyacetylene the preparation consisted of packing the field coils in wet asbestos to prevent damaging them. For electric resistance brazing this was not necessary. With the electric resistance method only a piece of asbestos sheet was required to cover the coil on the pole being brazed, in order to prevent radiant heat from the red hot carbons from affecting the field coils, as well as to prevent the tongs from coming in contact with the coils when they were being removed. For convenience the tongs were suspended by a rope from the hook of an overhead crane and this had to be shifted for each pole. The time for this, of course, is included in the overall time for brazing.

About 2 ounces of a 50 per cent silver alloy was used for each pole or approximately 1/3 ounce per braze. This was the same for both methods.

An accurate record was not kept of the gases consumed and the electrical energy used. The estimated cost of energy for electric resistance brazing at 2 cents per kilowatt hour was 30 to 40 cents per motor or per 96 brazes. The estimated cost of gases for oxyacetylene brazing, charging acetylene at $2.75 per 100 cubic feet and oxygen at $1.75 per 100 cubic feet was $8 to $10 per motor or per 96 brazes. A summary of the basic cost items is given in the accompanying table.

Equipment Not Unwieldy

Standard electric resistance brazing equipment includes a pair of brazing tongs, transformer, foot switch and the necessary connecting wires. General description of the process was given in STEEL, Sept. 11, 1930, page 59. Fig. 3 shows the 10-kilovolt-ampere equipment weighing about 95 pounds; wiring diagram is shown in Fig. 4. The brazing transformer is wound with a 220-volt or other standard voltage primary, and is arranged with taps so that 8, 10 or 12 volts can be obtained from the secondary. The tongs are connected to the transformer secondary by high-current low-voltage leads.

Jaws of the tongs comprise two carbon blocks and are held securely against the parts to be brazed by the screw-vise construction of the tongs. When the power is turned on by depressing the foot switch the heavy current in the secondary circuit generates heat in the relatively high resistance carbon blocks and this heat is rapidly transferred to the joint to be brazed. Because of this rapid transfer the heat is localized.

Flux Applied to Joint

A flux, usually fused borax, is applied to the joint either before or after the current is turned on. The current is applied until the flux melts, whereupon a strip of silver alloy is held against the hot metal until the alloy flows through between the pieces being brazed. Only a small amount of alloy is required to make the necessary thin film between the parts to be joined. The tongs are not released until the joint has cooled to a dull red color.

The type of joint in the amortisseur winding of the motors on which the electric resistance method supplanted the oxyacetylene torch is shown in Fig. 2. The position of the carbons is also indicated. Using the 8 volt secondary tap, one of these joints was brought to temperature and brazed in about 1 minute after the current was applied to the previously fluxed joint.

Standard electric brazing equipment such as illustrated in this ar-

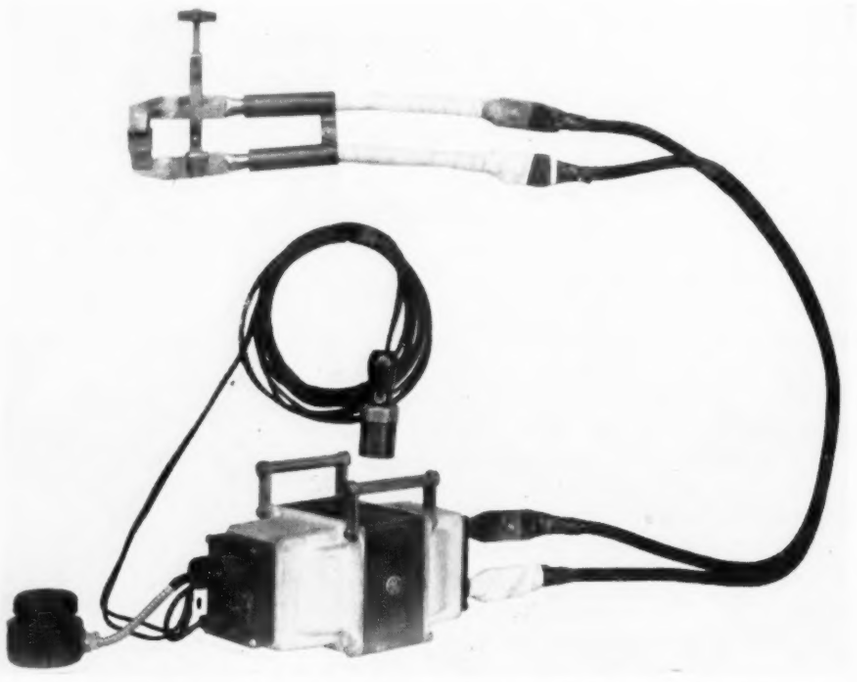


Fig. 3—Complete electric resistance brazing equipment of 10-kilovolt-ampere size, with transformer, tongs, plug, voltage change tap, foot switch and cable

ticle has been on the market for several years. The possible economy of the process, when properly applied, recommends itself to central stations and others engaged in the erection and maintenance of electrical equipment, as well as to industry in general.

Foundrymen Plan Chicago Meeting

PLANS for the 1933 annual convention of the American Foundrymen's association to be held in Hotel Stevens, Chicago, June 20-23, indicate that this year's meeting will be different and distinctive in many ways. Foundrymen will be given every opportunity to see, hear and discuss what concerns them most today—how to produce quality cast metal parts marketable at a profit.

New products, new equipment and latest improvements in standard equipment will be shown and demonstrated at the foundry and industrial exposition to be held in the exhibition hall of the hotel.

One feature of the program will be a four-act play dramatizing a foundry's experiences and adventures in determining and setting up a workable, efficient cost system. This is being prepared under direction of the association's cost committee with the co-operation of A. E. Grover, cost consultant of the Gray Iron institute.

Other features of interest will be a foundry housekeeping conference in co-operation with the National Safety council and National Founders' association, a materials handling session under sponsorship of the new joint committee of the A.F.A. and American Society of Mechanical Engineers; three sessions on steel castings; a session on cast iron in conjunction with the American Society for Testing Materials; and two sessions on malleable iron foundry problems.

The Century of Progress exposition opening in Chicago, June 1, will provide a background for the convention and exhibition.

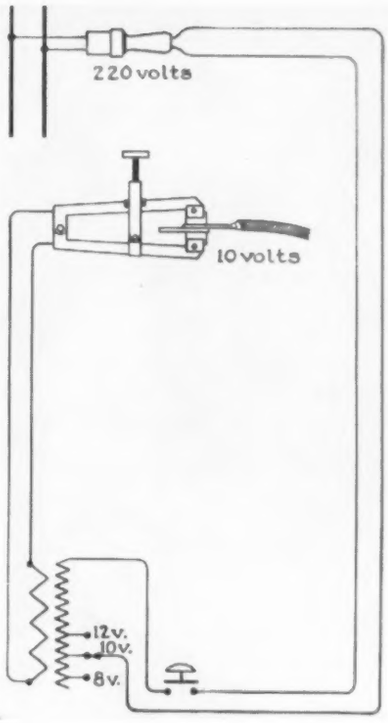


Fig. 4—Wiring diagram of circuits for electric brazing equipment shown in Fig. 3

High-Strength Cast Iron Demonstrates An Unusual Degree of Toughness

IN BUYING safes, the average purchaser probably gives little consideration to wheels, yet safe wheels must be sufficiently strong and tough to withstand the rough handling accorded this equipment when it is being moved around.

A Midwest foundry specializing in this type of casting is producing a high-strength cast iron which is found to be especially suitable for small parts in which great toughness is required. The charges used in producing this iron consist of 50 per cent steel scrap, the balance pig iron and cast scrap. The desired silicon content of approximately 2.50 per cent in the castings is obtained through cupola additions of silicon briquets produced by the Electro Metallurgical Co., New York.

Since ferroalloys in briquet form are highly resistant to oxidation while they are passing down through the charge, the recovery of the added alloy is very high, and close control of the chemical analysis of the cast iron is made possible. Wheels made of high-strength cast iron, while only ¼ inch in average cross section, are extremely tough and are found to be satisfactory for use on safes.

Representatives of this foundry are using these wheels as samples when seeking orders for other types of castings. The customer is presented with one of these wheels and asked to break it by throwing it on a concrete floor. In one instance 12 attempts were made before a crack appeared in the casting. Needless to say, the customer was greatly interested in an iron demonstrating such a degree of toughness.

As tougher and stronger cast irons are developed and corrosion and abrasion-resisting castings are becoming more popular, foundrymen are said to be turning to the use of ferroalloys in briquet form to insure the desired chemical composition of the finished product. Since the briquets are uncontaminated as they pass down through the charge and do not melt until they reach the hottest zone of the cupola, close control of the chemical analysis is readily possible, and the final chromium, manganese or silicon content can be closely predetermined.

In addition, the use of silicon briquets to replace the silicon in a portion of the pig iron ordinarily used in the charge reduces the size of the graphite flakes in the cast iron with the result that greater strength and toughness are assured.

Reaffirms Specifications For Steel Joists

Simplified practice recommendation R94-30, covering open web steel joists, has been reaffirmed without change by the standing committee of the industry, according to an announcement by the division of simplified practice, bureau of standards, Washington.

This recommendation, which was proposed and developed by the industry, is concerned only with joists between 8 and 16 inches in depth and not longer than 24 times their depth, and specifies properties and allowable loads in pounds per linear foot. In formulating this simplified list of definite depth dimensions, it was necessary to include designations, stresses, resisting moments in inch-pounds, and maximum end reaction in pounds.

Publishes Memorial Book

As a memorial to the life and death of Edward Orton Jr., former dean of its college of engineering, Ohio State university, Columbus, O., has published a 70-page book recording his activities as a man, a citizen, an engineer and an educator.

Prof. Orton organized the department of ceramics in 1894, the first of its kind in the United States, and was largely responsible for establishment of the engineering experiment station in 1913. He also founded the American Ceramic society in 1899.

He served as dean of the engineering college from 1902-1906 and 1910-1915. His death occurred in 1932.

IMPROVING OPEN-HEARTH FURNACE DESIGN

BY WILLIAM C. BUELL JR.

Part IV—Mechanics of the Roof

(Twenty-First Article of Series)

WHERE the bottom is constructed without crossbeams, witness furnaces D, F, K, L and M, Fig. 21, the buckstay system must of necessity be placed to bear directly on the girders, these being without the front and back wall brickwork and directly in the line of any overflowing metal or slag. If for no other reason than just stated, the crossbeam type bottom is amply justified.

Fig. 39-A, also can be considered as a quadrangle, pinned at the four corners that may retain its desired shape only so long as the forces at RF, RB and RF_1, RB_1 remain in equilibrium.

Various Members Affected

Consider then the effect at RF_1, RB_1 if the reactions at these points become unbalanced as for instance from the operation of the doors or any of several other factors that will increase the RF_1 at the front wall. This increase reflects in the same magnitude at RB_1 back wall, causing the rear buckstay at the top to tend to move forward. The only factor which will resist this overbalancing of the front wall, will be the development of a moment of sufficient value in the rear buckstay to counteract the effect. Since the only area in which a sufficient reaction for counteractive purposes, lies in the mass of brickwork forming the hearth, it follows that the bending moment so developed in the rear buckstay must have its counter reaction in the compression of this brickwork. This same reasoning can be applied in the restraint of all unbalancing reactions developing in an open-hearth furnace of which there are many.

On this basis of reasoning it can be stated for the top tie rod binding, that any reactions that unbalance the symmetrical reactions of the structure must be compensated by reactions developed in the brickwork. Moreover the maintenance of the furnace cross section in its designed form depends, first upon the ability of the brickwork to develop the necessary compression values without crushing, and, second, upon the ability of the buckstays to absorb noncalculable bending moments at indeterminate locations without undue distortion.

Granting that thermal effects in the past, as a result of poor insulating effects, have played a considerable part in the distortion of the furnace structure, and usually are charged with this condition, it is more than probable that a lack of knowledge and consideration of those factors of design just mentioned are responsible to a major degree for the bent buckstays and generally out-of-shape furnace bodies, ordinarily found in those plants where tie rods are employed at the buckstay tops. The prevailing use of top tie rod buckstays easily is discernible by examining Fig. 21. In considering the horizontal stresses developed in buckstays, when tie rods are used top and bottom, the buckstay is considered as a simple beam, supported at both ends.

Resulted in Disalignment

Formally when open-hearth roofs were of narrow span, thin brick and relatively light weight, when the principles of arch design as applied to roofs were unknown or at least unused and the development of the flattest possible roof was the desirable practice, slackening off of the tie rod nuts to prevent permanent distortion of the light buckstay sections by the enormous horizontal forces developed by thermal expansion in the flat roof when first heated, was justified. Modern appurtenances of the open-hearth charging floor with their close clearances then were unknown, and the disalignment of the buckstays by several inches was of no particular concern to operators.

However, the use of the upper tie rod is archaic, for today, while furnaces have roofs of relatively great span and the roof brick are of heavy weight and develop considerable forces, structural sections of ample properties to restrain the developed static and thermal forces are commonly available. Furthermore, the close clearances of mechanical charging apparatus will not permit inches at the front of the furnace to be usurped by a buckstay system that inclines forward.

While the trite but usual reference to the success and general acceptance of the semirigid top binding in tilting furnaces is cited, it is noted only for the purpose of demonstrating that a fallacy of operation, to the effect that tie rods were necessary and indispensable in open-hearth furnace construction, should have been exploded long since. However, it has required the few recent installations of stationary furnaces provided with rigid top binding to prove visually the untenability of one more fallacy that ever has lent itself to reduction by the application of simple mechanics. The installed furnaces with rigid top binding are accomplishing much more than their champions ever cared to voice. The term "rigid" as used in this connection is a misnomer. The top binding to be discussed is not "fixed" by the arrangement but actually is only partially restrained. A more descriptive term might be "semirigid."

Construction Differs

The section shown in Fig. 39-B is assumed to be similar to A other than that the top tie rod is replaced with a channel strut made fast to the buckstays and strengthened by the corner gusset plates which might equally well be girts. The mechanics of this arrangement are considerably different from A. In B it is reasonable to assume the buckstays as beams supported at the bottom and partially fixed at the tops in contradistinction to rigidly fixed, thus differing statically from the supported top tie rod arrangement of Fig. 39-A. While this arrangement offers no particular advantage if all loadings are the same on both the front and rear buckstays, equal loadings virtually are impossible of attainment in practice and, consequently, this type of binding if designed properly will compensate within itself for inequalities of stress and thus relieve the furnace brickwork of acting as a restraining medium for the buckstays. It therefore, is the only type that should be used in contemporary practice.

Fundamentally, the design of the buckstay system with a structural member securely connected to the buckstays at the front and back is analogous to that of the simple trestle bent of construction, excepting that

MANUFACTURERS
SPECIFICATION
WIRE
Bolt Wire
Chain Wire
Coat and Hat Hook Wire
Cold Heading Wire
Hinge Wire
Machine Screw Wire
Pail Bail Wire
Rim Wire
Rivet Wire
Screw Stock Wire
Spoke Wire
Wood Screw Wire, Etc.
THE YOUNGSTOWN
SHEET & TUBE CO.
General Offices
YOUNGSTOWN, OHIO
YOUNGSTOWN

the loading, which in the bent bears on the top member, is concentrated horizontally on the side members in the buckstays. In the static analyses to follow, the principles used are an adaptation of bent design.

Fig. 39-C is the arrangement of a tie rod binding applied to a furnace having a sloping back wall and is the predominant present-day design. By inspection it is obvious that the forces in such a structure must differ materially in both magnitude and direction at the front and rear buckstay elements. Again, it is emphasized that when the top tie rod is used the inequalities of forces which tend to move the buckstays out of line must be neutralized, if the structure is to retain its symmetry, by compensating compression within the brickwork and the development of counteracting moments, which may be great, within the buckstays themselves.

The semirigid buckstays, and much to be preferred arrangement for sloping back wall furnaces is shown in Fig. 39-D.

Laminated Type Affords Advantage

The rear buckstays of Fig. 39-E and F are of new design and if the laminated type of buckstay is used, offer a considerable advantage in the framing together of the top elements. This type buckstay is shown in connection with furnace I, Fig. 21. If the suspended roof, transferring the total weight of the roof system and the downward component of the roof force to the top of the buckstays, is incorporated in this design, then the moment of the cantilever effect of the bottom crossbeams may be considerable and necessitate the reinforcement of these beams. This appears as the only disadvantage of this design.

Schematic distribution of the weights and forces that react in the transverse binding system follows: The static forces of the roof react angularly at F, F_1 or F_2. These may be resolved by proper calculation into the horizontal forces HF, HF_1 or HF_2, and the vertical forces DF, DF_1 or DF_2. The horizontal forces are the principal forces that load the buckstays similar to a beam with a concentrated load and produce appropriate outward reactions at RF, RB, RF_1 or RB_1. With given roofs of similar span, rise and weight, the horizontal force at the ends will be the same though the chord be horizontal or angled.

Undoubtedly, the most satisfactory design calls for the suspension of the skews from the buckstay tops as previously described. Thus, the downward component of the roof thrust DF, DF_1 or DF_2, plus the partial weight of the roof reacting at the particular side reacts vertically downward from the buckstay top. This loading, the weight of the top transverse and longitudinal binding steel and the doors and such of their rigging as are attached to top members jointly constitute the loading that brings the buckstays into columnar effect. If other than the suspended type skew system is employed, then the roof weight and the downward component of the thrust bear directly on the top of the front or back wall and through them are transmitted as an evenly distributed load to the supporting girders. With the sloping back wall type this method of loading will develop secondary horizontal stresses in the rear buckstays. Of course, with this method of loading the buckstays are relieved of an equal weight of columnar effect.

Assuming that suspended type skews are used, then the top loading plus the weight of the buckstays themselves and their details, and such other items as door frames and casings that may be fastened directly to the buckstays and do not bear directly on the girders constitute the total loading of the buckstays at their bearing on the cross beams, DF+, DF_1+ or DF_2+ and represent a highly concentrated loading on the girders.

In Fig. 39 the girders are set back of the face of the brickwork and accordingly the crossbeams support the buckstays as a cantilevered loading. The weight of the front and back walls, the panel castings and generally the door frames are taken as bearing directly on the girders and are represented as FW or BW. Under previously mentioned conditions the weight of the roof and the downward component of the roof thrust also may be included in the loadings FW or BW.

Calculations Are Omitted

In the following discussions neither the loading, reactions or stresses at, nor the design of, the supporting girders are considered. The correct design of these girders is subject to so many variables, particularly, the number and spacing of their supports that descriptive calculation based on the establishment of arbitrary dimensions likely would be valueless. Furthermore the design of these members is based on elementary loading conditions the solution of which must be well understood by any who would qualify as furnace designers.

For the purpose of discussing the loadings and reactions to be found in the transverse furnace binding or buckstays system certain assumptions are of necessity required. A 150-ton furnace is assumed to include the ideal elements individually developed in the foregoing chapters. The bottom is in accordance with Fig. 9, the back wall with Fig. 19, the front wall with Fig. 20, the roof with Fig. 31 and the skew system with Figs. 34 and 36. The roof is of the ZE type, the included angle, θ=60 degrees, α=26 degrees 20 minutes and β=34 degrees 40 minutes.

The roof span is 19 feet 9 inches which is correct for Figs. 39-C, D, E or F, but overwide for a straight back wall type furnace of 150 tons capacity. This span is included for sections A and B, however, for a better comparison of the rearrangement of values as the chord is angled, the roofs in each case thus having the same dimensions and weight.

(To be continued)

Electron Tube Device Locates Flaws in Tubing

Flaws and cracks in tungsten or molybdenum wire, copper tubing, and similar materials are detected by a new vacuum tube oscillator developed by the General Electric Co., Schenectady, N. Y. The tubing test is based upon the change in electrical resistance of a small section of tubing which occurs when a defect is included in it. Eddy currents are induced in a small portion of the tubing by passing it through a coil connected in a dynatron oscillator circuit. Two of these oscillators are coupled together and connected through an amplifier to a loudspeaker and a meter. Each of the oscillators is provided with a coil, either or both of which may be used as test coils through which to pass the tubing. With a good section of tubing in the test coils, the oscillators are both tuned to the same frequency. Then, as the tubing is passed through the coils, a flaw will change the induced current sufficiently to change the frequency of one of the oscillators and cause a beat note in the loudspeaker and a deflection of the meter.

Steel Treaters Announce 1934 Campbell Lecturer

Dr. V. N. Krivobok, professor of metallurgy, Carnegie Institute of Technology, Pittsburgh, has accepted the invitation of the American Society for Steel Treating to deliver the Campbell Memorial lecture at the society's annual convention in 1934.

Associated with Carnegie institute for eight years and a member of the staff of the bureau of metallurgical research, Dr. Krivobok has worked principally with stainless and heat-resisting steels. He now directs graduate metallurgical students, at the same time continuing his studies.

He has published numerous papers in technical journals on chrome-nickel alloys, and has served as consultant to several manufacturers of rustless steels.

Last year the Campbell lecture was delivered by E. C. Bain, research laboratory, United States Steel Corp.; at the 1933 convention to be held in Detroit, Oct. 2-6, H. J. French, in charge of alloy steel and cast iron development, International Nickel Co., will be the speaker.

Sees Early Improvement in Depressed Metal Situation

WITH 40 technical sessions encompassing 150 papers, many dealing directly with the steel industry and allied metallurgical problems, the American Institute of Mining and Metallurgical Engineers marked the successful culmination of its 142nd meeting in New York last week, at the Engineering Societies building.

The usual ceremonies attendant with each February meeting of the institute were held. Walter H. Aldridge, president, Texas Gulf Sulphur Co., New York, was awarded the William Lawrence Saunders medal for distinguished work in the field of mining; James O. Elton, manager, International Smelting Co., Salt Lake City, Utah, was given the James Douglas medal for achievements in metallurgy. New president of the institute is Frederick M. Becket, vice president, Union Carbide & Carbon Co., New York, and a former chairman of the iron and steel division.

Vice presidents for 1933 are: Henry Krumb, director, Newmont Mining Co., New York, and Edgar Rickard, New York. Directors include: Cadwallader Evans Jr., general manager, Hudson Coal Co., Scranton, Pa.; John M. Lovejoy, president, Seaboard Oil Co., New York; Hugh Park, general manager, Nipissing mines, Cobalt, Ont.; Milnor Roberts, dean, school of mines, University of Michigan, Ann Arbor, Mich.; and Frank L. Sizer, consulting mining engineer, San Francisco.

Metals Are Hard Hit

In the general recession in the mineral industry during the last three years, metals have been affected more seriously than fuels, according to Scott Turner, director, bureau of mines, Washington, in his address as retiring president of the institute. Among the metals, pig iron has been the principal sufferer since 1929, he said. Not since 1898 has so little pig iron been produced. Similarly the output of copper was the lowest since 1898 and lead the lowest since 1899. While the production of gold has increased annually since 1929, probably because its value per unit has been unchanged, severe slumps in other metals have lowered the output value of the entire metal group.

The average price of mineral commodities became steadier in 1932, a factor which may indicate the sagging price level for that group has been halted, since the general average for other commodities dropped during last year. Many metal prices during the last three years have dropped far below actual cost of production, Mr. Turner declared, and he took the view that these levels cannot continue indefinitely. With production in some instances drastically curtailed there are evidences of a progressive abatement in the downward trend. Increase in metal stocks has more generally ceased and such stocks are now being held in stronger hands, which Mr. Turner declared caused reason for anticipating that the current continuance of low metal prices is but temporary.

Lectures on Steelmaking

The iron and steel division of the institute held four technical sessions, the annual Howe Memorial lecture being given by Dr. George B. Waterhouse, professor of metallurgy, Massachusetts Institute of Technology, Cambridge, Mass. Dr. Waterhouse reviewed the trends from one steelmaking process to another during the last 20 years and gave a brief forecast of the future.

A new thermocouple for the determination of temperatures up to at least 1800 degrees Fahr. was described by G. R. Fitterer, associate metallurgist, Pittsburgh experiment station, bureau of mines. It was described as the first couple that in addition to being useful in the determination of high temperatures, also combines simultaneously several other valuable qualifications.

Studies of the structure of Widmanstatten figures in slowly cooled hypoeutectoid and hypereutectoid, and in quenched hypoeutectoid, eutectoid and hypereutectoid Fe-C alloys were presented in a paper by Robert F. Mehl, director, bureau of metallurgical research and professor of metallurgy, Carnegie Institute of Technology, Pittsburgh; Charles S. Barrett, physicist, bureau of metallurgical research, Carnegie institute; and Dana W. Smith, assistant metallurgist, bureau of metallurgical research, Carnegie institute. The results of these studies, it was pointed out, confirmed theories for the formation of Widmanstatten figures previously proposed in this series of papers.

J. S. Vanick, development and research department, International Nickel Co. Inc., New York, described "an improved nickel-chromium hardened chilled cast iron," from which a wide variety of commercial castings is being successfully produced, ranging in size from the small-grain grinding plates or burrs through medium castings such as sand pumps up to large heavy castings, such as rolls for metal rolling or cement grinding. This iron, the speaker declared, is being regularly produced by alloying a good base composition of chilled or white cast iron with essentially 4 to 6 per cent of nickel and 1 to 2.5 per cent of chromium. Such material can attain a hardness exceeding 600 to 750 Brinell, as against 380 to 530 for corresponding grades of plain chilled iron.

Eric R. Jette and Earl S. Greiner, associate professor of and graduate student in metallurgy, respectively, Columbia university, New York, gave the following results in an X-ray study of iron-silicon alloys, containing 0 to 15 per cent silicon: In the range between 0 and approximately 6 atomic per cent (0 to 3.1 weight per cent) completely homogenized alloys will have properties that vary regularly in a way that would be expected of a series of homogeneous solid solutions; in the range around 9 atomic per cent (4.7 weight per cent) or perhaps between 6 and 9, irregular behavior may be expected; and in the range above 9 atomic per cent, regular variation in the properties should again be expected up to 25 atomic per cent, but the absolute values of the quantities will probably indicate that the alloy is less and less "typically metallic" as the composition approaches Fe_2Si.

Determination of Oxides

Oxide analysis by iodine extraction in steelmaking problems was discussed by J. J. Egan and W. Crafts, research metallurgists, and A. B. Kinzel, chief metallurgist, all of the Union Carbide & Carbon Research Laboratories, Long Island City, New York. The iodine method, they concluded, gives total oxygen values which check accurately those obtained by the aluminum method for plain carbon and manganese steel. It should not be used in connection with steels containing the stable carbide-forming elements.

In discussing properties of low carbon medium-chromium steels of the air-hardening type, E. C. Wright and P. F. Mumma, metallurgists, National Tube Co., Elwood City, Pa., declared that steel of desirable properties may be obtained from the range of composition and heat treatments studied, and that the 1 per cent chromium series does not contain sufficient chromium to improve either the mechanical properties or corrosion resistance to any marked extent, while the steels containing 7 per cent chromium do not exhibit any particular advantages over those containing 3 and 5 per cent chromium.

Physical properties of the 3 and 5

(*Please turn to Page 37*)

Making the Most of

METHODS AND MATERIALS

IN COAL mines where acid mine water corrodes and eats away ordinary ferrous and nonferrous metals, 28 per cent chrome steel has been found satisfactory for pumps, piping and fittings. This metal also offers good resistance to abrasion as well as corrosion and has been found suitable for sand pumps. Metal of this composition also has been used with satisfaction for pumps, piping and fittings in copper mines using the leaching process. Twenty-five per cent chrome steel likewise has been used for various parts of equipment handling calcines where a combination of corrosion and high temperature resistance is required. It has been found satisfactory for jig and shaker screens, chutes, conveyor flights, baffles, shovels, bolts and nuts and other parts commonly attacked by the corrosive action of the acid mine water.

S S S

Blowers handling acid vapor have been coated successfully with sprayed corrosive resisting metals; likewise, the interiors of tanks or acid containers have been protected with sprayed lead. In the aluminum and zinc fields, a number of meter housings have been sprayed with thin coatings to replace paint and one large public utility company, after extensive tests, contemplates protecting the exterior surface of several large gas holders, each involving over 10,000 square feet area.

S S S

FOUR years ago an Ohio stampings manufacturer placed four storage-battery, high-lift type industrial trucks in service and since that time these trucks have moved over 245,000 tons of material, transporting it approximately 19,074 miles. They have made 191,400 trips, averaging 300 to 1200 feet each, and have made about 756,600 lifts, starts and stops. These figures are for direct production only and do not include many miscellaneous tasks. The five original batteries, including one spare, still are used and are in good condition. With interest, depreciation and maintenance of the batteries as well as the charging equipment added to the cost of charging current, the total cost per battery per year amounts to only $238.57—a daily cost based on a 300-day year of 79.5 cents, or an hourly cost of but 0.0833 cents.

S S S

A large cash register manufacturer now is chromium plating its steel tools which are used for engraving copper, brass and other nonferrous metals. The life of these engraving tools has been multiplied about 20 times as a result of the plating.

S S S

In determining whether plants are overmotored under present operating conditions, consideration should be given to motor-generator sets. Much direct-current equipment has been changed to alternating current,

but in most instances, the motor-generator set is operated as originally installed. Recently a 50-kilowatt unit in a Middle West plant was tested and was found to have only a 15-kilowatt load. The set was changed to fit the job.

S S S

The oxyacetylene blowpipe has proved a valuable accessory in the heat treating department as a tool for application of local heat. It can be used for heating odd parts for which a furnace is not available or it may be used for local heating where it is impractical to use a furnace. Now it is being used rather extensively for hardening the ends of valve stems and for locally annealing hardened steel such as armor plate. The blowpipe also has found some application in the local cyaniding of small areas which must be hard.

S S S

All corrosion-resisting alloys produced in an ingot form and rolled into bars and shapes now are available as castings. However, the analysis limits required for some classes of service present extremely difficult problems to foundrymen. The difficulty of machining certain of these alloys, particularly the 18-8 chrome-nickel steel, has been eliminated by the introduction of sulphur, selenium or tellurium.

S S S

WHEN old Fort Mason Dock No. 4 in San Francisco bay, built a few years prior to 1884, was dismantled recently, it was found that the puddled iron piles which support it were still in excellent condition after half a century of exposure to corrosion. City authorities put some of them back into service as piles and made use of others in construction of a water supply pipe. The piles were sections of pipe, connected by threaded couplings, and driven into sand and silt to a depth of 20 to 25 feet. Inspection showed the piles to be covered with a protective rust scale tightly adhering to the iron and there appeared to be no marked difference between corrosion that had taken place below low water, between high and low water, and above, where they were reached by spray. This scale apeared to be a slag coat forming practically a continuous tight skin, while the scale on the steel superstructure was flaky and loose.

S S S

In welding gray cast iron, careful preheating of the entire casting to a good red heat is by far the best means of assuring that expansion and contraction of the metal will be even throughout. After welding, a preheating and controlled cooling or annealing will eliminate internal stresses. Also, preheating and slow cooling are essential factors in producing a proper gray iron structure in the welded casting.

SCANNING THE FIELD OF TECHNOLOGY

A Digest of Important Developments Pertaining to the Production, Processing, Application and Performance of Steel

34 Per Cent Chromium Iron

By E. Houdremont and R. Wasmuht, in Metals & Alloys, February, p. 13, 5 pp., 8 ills., 5 charts, 1 table, translated from a German publication, Krup'sche Monatschefte.

Three alloy cast irons, each containing about 34 per cent chromium, were investigated by the authors, all revealing excellent corrosion resistance, erosion resistance and heat resistance. Carbon contents varied from 1.1 per cent to 3.1 per cent. The alloys have been placed on the market under the proprietary name of "Nirostaguss." They lend themselves to the production of a wide variety of parts, from small fittings to large drying rolls for paper mills.

—STEEL, 2-27-33

Sheet vs. Strip Steel

By Edward S. Lawrence, in Transactions of the American Society for Steel Treating, February, p. 119, 20 pp., bibliography.

General differences in the manufacture of sheet and strip steels of the low-carbon variety as utilized primarily for deep and extra deep drawing automobile stampings are emphasized. Some of the most common defects and limitations encountered in the manufacture of strip steel for this particular and ultimate use are contrasted with some of the more common defects attributed to the manufacture of sheet steel. The adaptability of strip steel as made on a continuous four-high mill as breakdowns to be used on a conventional two-high sheet mill is emphasized.

—STEEL, 2-27-33

Suppression of Banding

By Harold L. Geiger, in Metal Progress, January, p. 37, 4 pp., 8 photomicrographs.

Discussion of correct heat treatment to eliminate ferrite banding in S. A. E. 3100 gear steels.

—STEEL, 2-27-33

New Thermocouple

By G. R. Fitterer, paper presented at meeting of the American Institute of Mining and Metallurgical Engineers in New York, Feb. 20-23, preprinted, 8 pp., 4 ills., 2 tables.

Description is given of tests made on a new type of thermocouple suitable for determination of temperatures up to at least 1800 degrees Cent. The couple comprises a silicon carbide rod run lengthwise through a carbon tube closed at one end. Hot junction is prepared by tightly fitting the silicon carbide rod into a socket in the inside of the closed end of the tube. Cold junctions are made for both elements by means of water circulating through copper coils.

—STEEL, 2-27-33

Design and Production

By Harold F. Shepherd, in Machine Design, February, p. 22, 4 pp., 8 ills., part III of a series.

Third installment of this discussion deals with welding. Designers who are planning the use of welded parts or structures are concerned primarily with the matter of getting the separate parts of the assembly into proper form preparatory to welding. Ingenuity often is required to insure pleasing appearance without spending too much for forming operations. A number of cases are cited to show how problems arising in fabricating parts to be welded have been solved.

—STEEL, 2-27-33

Hard Surfacing Coal Bits

Oxy-Acetylene Tips, February, p. 34, 2 pp., 2 ills.

Describing economies which have been effected by the application of stellite hard surfacing material to 0.40-0.80 per cent carbon steel bits used on undercutting machines in coal mines.

—STEEL, 2-27-33

Electronic Devices

By F. H. Gulliksen, paper presented at the winter meeting of the American Institute of Electrical Engineers in New York, Jan. 23-27, 23 pp., 10 illls.

General characteristics of electronic control devices are outlined and the features which make the application of these devices desirable from an industrial point of view are discussed. Various recent developments in photoelectric devices for industrial control are described in detail.

—STEEL, 2-27-33

Reducing Polishing Costs

By George S. Brady, in Iron Age, Feb. 23, p. 303, 2½ pp., no ills.

Use of the tumbling, or barrel rolling, process for polishing and "coloring" metal parts has increased, especially during the past three years, because of savings it makes possible in eliminating or reducing hand-polishing operations. Successful application involves consideration of a number of variables, many of which are discussed in this article. The information given covers both dry tumbling or coloring and wet rolling.

—STEEL, 2-27-33

Hardness and Temperature

By O. E. Harder and H. A. Grove, a paper presented at the annual meeting of the American Institute of Mining and Metallurgical Engineers in New York, Feb. 20-23, preprint No. 497, 39 pp., 14 ills., 14 tables, bibliography.

Results of an investigation into the hardness of high-speed steels at elevated temperatures. The mutual indentation method of hardness testing was used.

—STEEL, 2-27-33

Sheet Steel Industry

By W. H. Melaney, in Blast Furnace and Steel Plant, January, p. 28, 3½ pp., 1 ill.

Tracing the development of the rolling of sheet steel from its inception in 1818, with discussion of various methods now in practice, including the Steckel process.

—STEEL, 2-27-33

Welding Pressure Vessels

By P. R. Hawthorne, in Welding, January, p. 13, 4 pp., 8 ills.

Commenting upon X-ray examination, stress relieving and shop organization required for the production of classes 1 and 2 pressure vessels.

—STEEL, 2-27-33

Polishing Electric Irons

Abrasive Industry, March, p. 8, 3½ pp., 6 ills.

Discussion of grinding wheels and other abrasives used by a leading manufacturer to obtain the required quality finish on electric irons for domestic use.

—STEEL, 2-27-33

Stainless Iron

By A. L. Field, in Metal Progress, February, p. 13, 5 pp., 2 ills.

Presenting details of the manufacture of stainless iron from ferrochromium, from scrap or from ore.

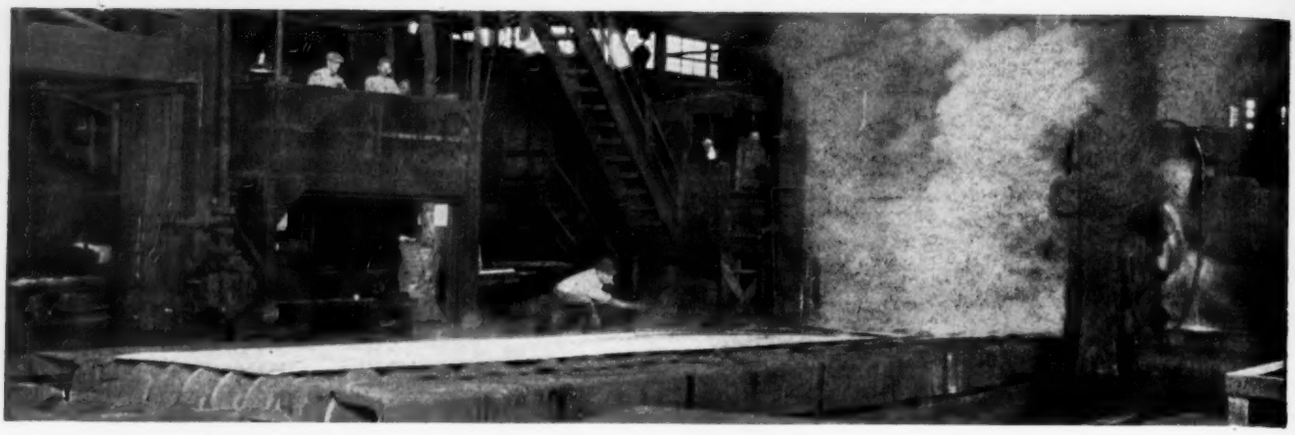
—STEEL, 2-27-33

Making Rifles, Shot Guns

By J. B. Nealey, in American Machinist, Feb. 15, p. 111, 2½ pp., 6 ills.

How machining methods and heat treatments in the firearms industry keep pace with modern trends.

—STEEL, 2-27-33

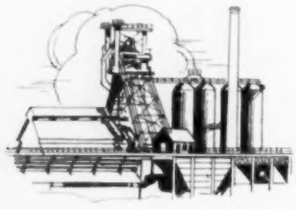


PROGRESS IN STEELMAKING

DESIGNED for continuous operation is the function of a gas indicator recently developed in England. The action of the instrument now on the market there, depends upon the comparison of the viscosity-density properties of the gas being tested against air in a bridge. The latter comprises two capillary tube or orifice plate combinations in parallel with one another, one side taking the gas under test and the other taking air. The composition of the gas is indicated by a special manometer connected across the chambers immediately in front of the two orifices. Suction is provided by a small motor-driven pump; the arrangement is operated automatically under extreme sensitive and highly stable conditions. A single instrument can be used to indicate alternatively one of a number of different gases and should find wide application at coke oven, blast furnace and open-hearth departments.

♦ ♦ ♦

Synthetic resin and a textile material are the basis of a new roll neck bearing designed for rod, strip, merchant bar, structural plate and blooming mills. Definite saving in the initial cost, long service and decreased power consumption are claimed for the bearing.



TURBULENCE is provided and a more uniform gas distribution effected in a new type primary dust catcher recently installed at a blast furnace in the Great Lakes district. The new unit, which utilizes a zeppelin or streamline principle of construction on the interior, affords an increase in the efficiency of blast furnace primary dust catchers from about 20 to 60 per cent.

PROXIMITY of gage thickness on plates and sheets has been a long existant condition in flat rolled steel. Under present conditions of low tonnage several platemakers are rolling a gage or two into the sheet range. One mill has stepped up as much as two gages on its plate mill in order to roll sheets, which has resulted in a satisfactory sheet steel product.

♦ ♦ ♦

Low-carbon stainless steel scrap containing 18 per cent chromium and 8 per cent nickel is being remelted in high-frequency induction furnaces with no loss of nickel and only a 0.40 per cent loss of chromium. Remelting this grade of scrap in arc type furnaces is difficult without introducing carbon in the charge from the electrodes. Eliminating the pickup carbon by "oreing down" the heat lowers the alloy content of the bath more than the carbon.

♦ ♦ ♦

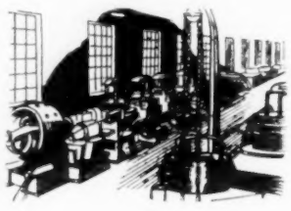
Manganese in the crude iron of rimming steel charges should not exceed 0.50 per cent for large single-cast ingots, according to an authority on this grade of steel. Otherwise, an excessive amount of hydrogen may be introduced to the bath and too much retained at the end of the heat.

♦ ♦ ♦

Improving the holding properties of nails, cotter pins, bolts, screws and staples has been accomplished by a sandblasting process. Roughening the surface of the wire can be effected before the nail is formed. The fastening, whether treated before or after forming, can be galvanized without destroying the roughness. Tests show that sandblasted nails have a holding power ranging from 149 to 173 per cent higher than plain nails. The roughening treatment is applied to large quantities of nails simultaneously at a cost of 0.4-cent per pound.

♦ ♦ ♦

Qualitative and quantitative analysis of furnace heats within 30 minutes is the purpose of a newly devised recording microphotometer. A spectogram of the metal is made and the plate placed in the holder of the instrument where it moves through a beam of light. The source of light is an ordinary high-powered electric bulb which is focused by condensers on a slit, the latter being projected on the spectrum plate through a microscope objective. The image produced by the light on the plate is picked up by a microscope objective on the opposite side of the plate, passes through another slit and falls on a photoelectric cell. The current thus generated is amplified by a vacuum tube and then passes through a recording milliameter which registers the variations on a graph.



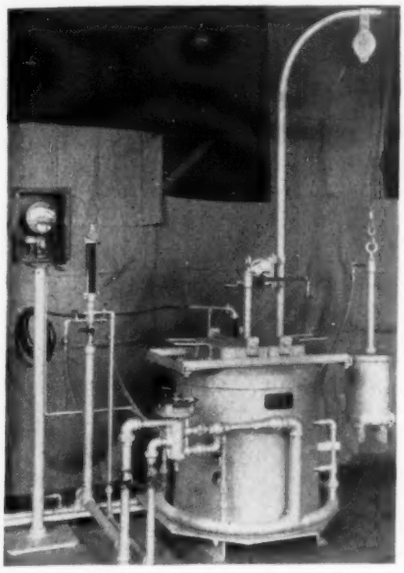
IN MANUFACTURING tungsten-carbide wire drawing dies the best diamond tool life, as far as known, is obtained at a surface speed of about 100 feet per minute with a cut 0.003 to 0.004-inch deep and a feed of 0.0008 to 0.00012-inch per revolution.

NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

Bell-Type Retort Furnace Has Wide Application

American Gas Furnace Co., Elizabeth, N. J., recently has developed a bell-type retort furnace which is adapted to carburizing using a hydrocarbon gas, nitriding using



Bell-type retort furnace designed by American Gas Furnace Co.

ammonia gas, or bright annealing using a neutral or inert gas, as well as the customary operation of hardening, normalizing, annealing and tempering.

Because of the wide range of heat treatment possible, this equipment is suitable for the jobbing shop where a variety of work is handled from day to day. For the larger shop it is equally useful because a battery of these furnaces can be installed to permit a wide range of heat treating operations to be carried on simultaneously.

In the case of carburizing, the spent carburizing gases escape from the bottom of the bell and are consumed in the furnace, thus increasing the efficiency. Furthermore, radiation losses are low because the bell is entirely enclosed by the furnace, which results in greatest fuel economy.

Work can be cooled in the furnace if desired. Quenching direct from furnace temperature is accomplished either by removing the bell, allowing the work on the base to remain in the furnace for removal of the individual pieces and quenching, or, as in the case of ring gears, a special yoke may be employed to elevate the base and work slowly so that the individual gears may be withdrawn and quenched in a jig, fixture, or quenching machine.

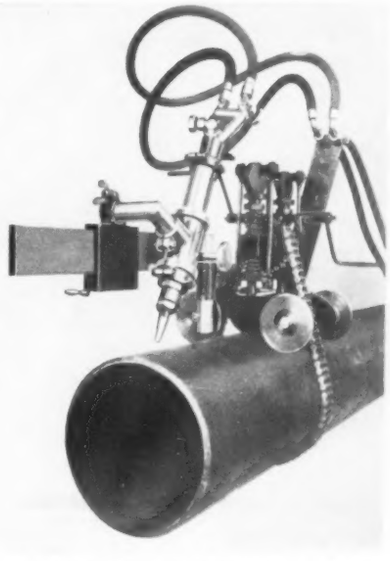
◆

Develops Pipe Cutting and Beveling Machine

Air Reduction Sales Co., Lincoln building, New York, recently introduced a portable machine to cut off and bevel pipe to the desired welding angle. The unit, shown herewith, comprises a light four-wheel carriage on which is mounted a crank-driven chain sprocket and a torch supporting bracket. The carriage is held against the pipe by a roller chain surrounding the pipe and engaging a sprocket. Supported by coil springs, the sprocket reacts on the chain. When a hand crank is turned frictional grip of the chain rotates the pipe when it is free to turn. When the pipe is fixed in position the machine rotates around the pipe.

The machine cutting torch is adjustable on the bracket to any required bevel angle from vertical for cutting off square, to 45 degrees, more or less, for any welding bevel required. The torch also may be adjusted laterally to produce a lead cutting angle.

When setting up for pipe beveling, the chain, which is furnished with separable sections covering pipe sizes from 4 to 12 inches diameter, is adjusted to the approximate length required, and the ends are brought into engagement. Tension then is set up in the chain by compressing the coil springs supporting the sprocket shaft. Subsequently, the machine is rocked back and forth to straighten the chain and align the wheel axles parallel to the pipe.

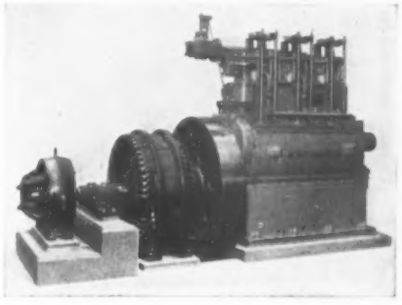


Airco style No. 1 pipe cutting and beveling machine

◆

Wide Power Range Features Vertical Gas Engines

Worthington Pump & Machinery Corp., Worthington avenue and Warren street Harrison, N. J., recently announced an improved line of ver-



Vertical gas engine built by Worthington Pump & Machinery Corp.

tical four-cycle gas engines covering wide power range in a variety of cylinder combination. These units, one of which is shown herewith, are built with one to eight cylinders and 30 to 150 horsepower per cylinder. The fact that they can be converted to diesel operation makes them additionally attractive.

Many unusual details of construction are incorporated in these engines. A mixing valve, common to all cylinders and adjustable through a single knurled handscrew, is employed on all but the largest units. Separate air and gas mixing valves independently adjustable for each cylinder are installed in each cylinder head of the largest engines. In all but the smallest units, air inlet and exhaust valves are carried in removable and interchangeable cages, the exhaust valve cages being water

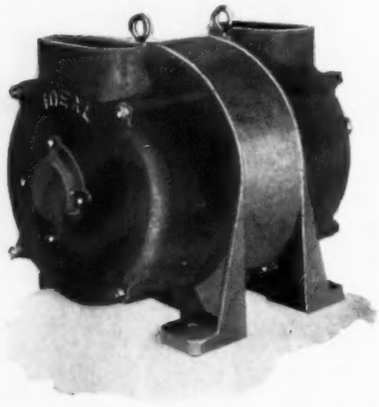
cooled; in the smaller engines, these valves (also interchangeable and adjustable) seat directly in the cylinder head and operate in removable bushings.

An attached reciprocating pump circulates lubricating oil through a cast-in duct in the base with cast-in branches leading to the bottom of each main bearing. Through drilled passages in the crankshaft and connecting rods, the oil reaches the crank and wristpin bearings under pressure from the main bearings.

◆

Pipe-Ventilated Motor Employs Fan

Ideal Electric & Mfg. Co., Mansfield, O., recently announced a new pipe-ventilated motor, shown herewith, especially designed for applications where the advantages of a totally enclosed motor are desired. Ventilation is supplied by a centrifugal fan which draws clean air in at one end and discharges warm air from the other. The unit is a totally-enclosed, polyphase, squirrel-cage induction motor. Intake openings may lead to any source of cool clean air while the outlet may be left free to discharge in the room or may be piped outside. Vent pipes are connected to the vent stacks shown.



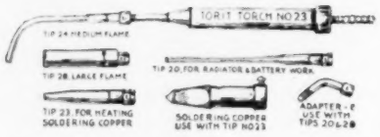
Pipe-ventilated motor made by Ideal Electric & Mfg. Co.

Motors are supplied to meet all torque and inrush classifications for both squirrel-cage and slip ring induction motors from 1 to 200 horsepower, including across-the-line start motors. Unity and leading power factor induction motors also can be had.

◆

Soldering Outfit Comprises Small Torch

St. Paul Welding & Mfg. Co., 223 West Third street, St. Paul, recently placed on the market a small torch with four different tips, a soldering copper, rubber tubing and connection for a small acetylene tank. Designated Torit soldering outfit No. 23, it is convenient for soldering, tempering, light brazing, wire splicing etc. and for all types of small jobs requiring heat. It is not intended for welding. The outfit, shown in the accompanying illustration, requires no oxygen or compressed air; the necessary air for combustion is syphoned through the tips.

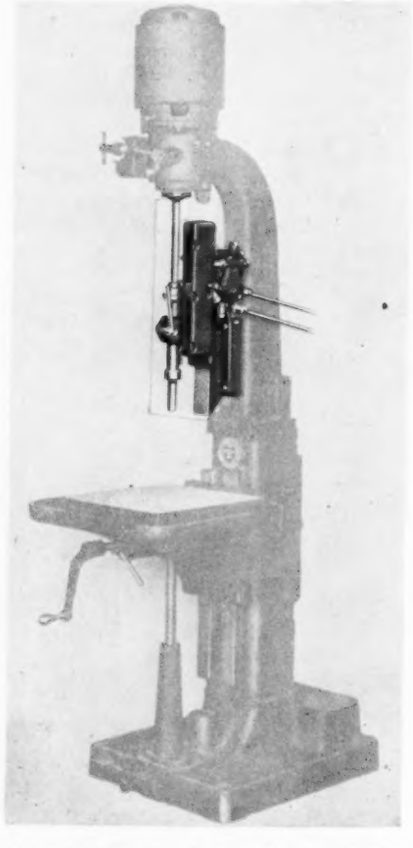

TORIT TORCH NO 23
TIP 24 MEDIUM FLAME
TIP 28 LARGE FLAME
TIP 20 FOR RADIATOR & BATTERY WORK
TIP 23 FOR HEATING SOLDERING COPPER
SOLDERING COPPER USE WITH TIP NO 23
ADAPTER - E USE WITH TIPS 20-28

Torit soldering torch furnished with four different tips

◆

Adapter Unit Provides Hydraulic Feed

Leland-Gifford Co., Worcester, Mass., recently announced that its drilling machines now may be equipped with the same hydraulic feed that has been furnished for a number of years on its unit-cycle machine. This feed is applicable to either the belt or motor spindle machines as shown.



Leland-Gifford hydraulic adapter mounted on motor spindle unit

Either a continuous or step-by-step control can be supplied for the hydraulic feed. When the operation is such that the drill does not have to be relieved in the hole because of the need for coolant or to furnish clearance for chips, the continuous feed cycle is furnished; for drilling long deep holes in drop forgings and other tough materials, the step-by-step method of control is provided.

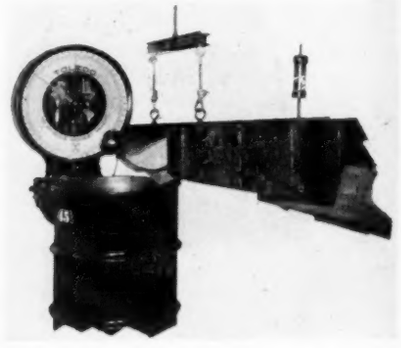
Usually the maximum feed is 6½ inches, although when extra long holes are to be drilled a feed of 10 inches can be furnished. Length of the steps with the step-by-step control can be varied from 3/16-inch up.

◆

Vibrator Filling Machine Employs "Electric Eye"

Toledo Precision Devices Inc., Toledo, O., just recently announced a vibrator filling machine, shown in the accompanying illustration. This new device controls the automatic feed of materials from supply bins to the scales and the automatic weighing out of predetermined amounts in packing operations. It consists of a Toledo scale, an "electric eye" cut-off attachment, and a vibrator holding the articles such as nails, pins, washers, nuts, etc. to be packaged.

Weights equivalent to that of the filled container are placed on the platter of the scale. For drafts of more than 30 pounds, the scale is set for the net weight of the commodity plus the weight of the container by setting the poises on the beams, or by means of a set back indicator. The vibrator, attached to the scale, is supplied with the commodity from a larger hopper or bin placed nearby.



Toledo vibrator filling machine is simple to operate

Ingot Rate Off 2 Points; Spring Work Looms

Operations Slowed to 17 Per Cent by Slackening Motorcar Production, Other Factors—Stabilized Sheet and Concrete Bar Prices Being Issued

DIRECTLY responsive to curtailment in demand, traceable largely to the full effects of the Michigan bank moratorium and numerous other localized business disturbances, further slowing in automobile production, and delay in placing railroad tonnage, steel producers have reduced operations 2 points to 17 per cent.

The Cleveland district, down more than 5 points to 31 per cent, reflects sharply the contraction in automotive specifications; Youngstown is off 4 points to 17 per cent; and Pittsburgh off 3 points to 18 per cent, with rail and structural shape orders lacking, and fewer miscellaneous requirements. Though the upward trend at Chicago also appears temporarily arrested, the 18 per cent rate there shows only a minor deflection.

This first break in the general operating rate this year is accepted philosophically as part of the backing and filling expected to accompany the various stages of recovery. Hope still is entertained that with the opening of outdoor work moderate expansion will occur. A more settled national administration policy, after March 4, also is anticipated as a basis for renewed confidence.

Prospective seasonal work requiring large steel tonnages is more in evidence. In structural steel, though awards for the week were only 5347 tons, bids are being closed on the major portion of the San Francisco-Oakland bridge, taking 117,000 tons; postoffice construction is being resumed, and highway work shows signs of recovery. For a Newark, N. J., viaduct 3500 tons of shapes will be required shortly.

Efforts are being made to liberalize the Reconstruction Finance Corp.'s interest rate on loans to municipalities for water and sanitation projects, and upon the outcome depends a large volume of pipe business. A Pittsburgh district mill has booked 2000 tons of steel pipe for a 34-mile gas line for the Southern Union Gas Co. The Colorado rail mill has resumed after nearly a year's idleness. Some important rail inquiries are due early in March.

Increasingly, the foreign situation as it pertains especially to Japan and China is commanding the attention of steelmakers. American iron and steel exports in January made a sudden spurt to 56,720 tons, largest since last May, and of this amount Japan took 24,662 tons, of which 22,640 tons was scrap; and Italy, 7573 tons of scrap; these two items accounting for more than half the month's exports. China is in the market for 3400 tons of relaying rails at Seattle. The treasury department has ordered the appraisal of all foreign iron and steel imports, except those against which specific dumping charges have been issued, be resumed as if no complaints had been filed.

A new schedule of sheet prices is expected to be issued shortly by leading producers, in accordance with recent efforts to stabilize the market. Makers of billet steel reinforcement bars, also endeavoring to stabilize prices, have announced 1.40c for mill lengths, Chicago, Pittsburgh and Buffalo; 1.45c, Cleveland, and 1.60c, Detroit; rail steel bars, 1.30c, Pittsburgh, Buffalo, Chicago and St. Louis.

February extended the gain in pig iron shipments, in the Great Lakes district exceeding January's by approximately 10 per cent. A blast furnace at Sheridan, Pa., has resumed, on production of ferromanganese. Coke demand also has shown moderate improvement.

Pending the announcement on sheet prices, STEEL's iron and steel composite remains $28.31, and the finished steel composite $45.40, unchanged from the preceding week. The scrap composite is off 4 cents to $6.33.

Composite Market Averages

	Feb. 25	Feb. 18	One Month Ago Jan., 1933	Three Months Ago Nov., 1932	One Year Ago Feb., 1932	Ten Years Ago Feb., 1923
Iron and Steel Composite	$28.31	$28.31	$28.68	$29.12	$29.56	$42.61
Finished Steel Composite	45.40	45.40	46.13	47.20	46.72	61.60
Steelworks Scrap Composite	6.33	6.37	6.23	6.87	7.89	20.65

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	Feb. 25, 1933	Jan. 1933	Nov. 1932	Feb. 1932
Pig Iron				
Bessemer, del., Pittsburgh	$15.76	15.76	15.76	16.96
Basic, valley	14.00	14.00	14.00	15.00
Basic, eastern, del. eastern Pa.	13.50	13.50	13.50	16.00
No. 2 foundry, del. Pittsburgh	15.76	15.76	15.75	16.76
No. 2 foundry, Chicago	15.50	15.50	15.50	16.50
*Southern No. 2, Birmingham	11.00	11.00	11.00	11.00
**No. 2X, Virginia furnace	17.75	17.75	17.75	18.00
**No. 2X, Eastern, del., Phila.	13.76	13.76	13.95	15.76
Malleable, valley	14.50	14.50	14.50	15.50
Malleable, Chicago	15.50	15.50	15.50	16.50
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	23.04
Gray forge, del. Pittsburgh	15.63	15.63	15.63	16.33
Ferromanganese, del. Pittsburgh	73.24	73.24	73.24	80.24

*1.75-2.25 silicon. For local delivery. Northern shipments based on $10, Birmingham. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

Coke				
Connellsville, furnace, ovens	1.75	1.75	1.80	2.25
Connellsville, foundry, ovens	2.50	2.50	2.65	3.25
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	27.00
Wire rods, Pittsburgh	35.00	36.20	37.00	37.00

	Feb. 25, 1933	Jan. 1933	Nov. 1932	Feb. 1932
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.50
Steel bars, Chicago	1.70	1.70	1.70	1.60
Steel bars, Philadelphia	1.91	1.91	1.91	1.81
Iron bars, Chicago	1.65	1.65	1.65	1.70
Shapes, Pittsburgh	1.60	1.60	1.60	1.50
Shapes, Philadelphia	1.65	1.70	1.75	1.62
Shapes, Chicago	1.70	1.70	1.70	1.60
Tank plates, Pittsburgh	1.60	1.60	1.60	1.50
Tank plates, Philadelphia	1.59½	1.66	1.77	1.69¼
Tank plates, Chicago	1.70	1.70	1.70	1.60
Sheets, No. 10 blue anneal., Pitts.	1.60	1.65	1.70	1.70
Sheets, No. 24, hot ann., Pitts.	2.00	2.05	2.10	2.15
Sheets, No. 24 galvan., Pitts.	2.50	2.70	2.85	2.75
Sheets, No. 10 blue anneal., Chi.	1.85	1.85	1.85	1.90
Sheets, No. 24 hot ann., Chi.	2.15	2.25	2.25	2.35
Sheets, No. 24 galvan., Chi.	2.75	2.85	2.90	2.95
Plain wire, Pittsburgh	2.10	2.15	2.20	2.20
Wire nails, Pittsburgh	1.85	1.90	1.95	1.95
Tin plate, per base box, Pitts.	4.25	4.25	4.50	4.75
Scrap				
Heavy melting steel, Pitts.	$8.25	8.35	9.15	10.25
Heavy melting steel, eastern Pa.	6.50	6.50	7.25	7.35
Heavy melting steel, Chicago	5.25	5.25	5.60	6.80
No. 1 wrought, eastern Pa.	6.50	6.50	7.25	9.00
No. 1 wrought, Chicago	5.00	5.00	5.60	6.85
Rails for rolling, Chicago	7.75	8.05	8.25	9.85

Sheets

Stabilized Prices Awaited—Auto Releases Generally Lower —Refrigerator Stock Moving

SHEET PRICES, PAGE 35

Pittsburgh—Orders for practically all classes of sheet mill products underwent a decline last week as against a fairly encouraging trend for two or three weeks previously. The price schedule continues unchanged pending announcement of definite decision to incorporate some changes in marketing sheets. This means continuation, in the meantime, of 2.50c to 2.60c on galvanized, with black 2.00c to 2.10c and blue annealed quoted by some mills at 1.60c. The Follansbee, W. Va., producer expects to close its steelmaking capacity for March but is understood to plan continuation of mill schedules on sheets.

Philadelphia—Galvanized sheets are firm at 2.60c, Pittsburgh, on new business, no real test is anticipated until contracts come up for renewal in March. Tin mill black is firm at 2.30c, Pittsburgh. Demand for sheets generally is slightly improved.

Cincinnati — Spot demand for sheets has not improved, an upward trend for refrigerators being offset by lighter releases in the automotive trade, with one exception. Some inquiry for second quarter, aroused by firming prices, is reported.

New York—Sheets continue to display increased steadiness. The runaway market was halted with 2.60c, Pittsburgh, generally quoted on galvanized, and recent lows on other grades disappearing.

Chicago—While producers are attempting to bring about a stronger price situation, some unsteadiness still prevails. The nominal market on galvanized is 2.70c, base, although lower prices are going. Hot-rolled annealed sheets generally are 2.10c. Business is fairly steady, but definite improvement is lacking. Orders are fairly well diversified with individual tonnages light. Mill operations continue around 20 per cent.

St. Louis—Evidence of more price stability is noted in the sheet market, though sales have not increased recently. Production is unchanged from the early February rate.

Cleveland—Sheetmakers are preparing a new schedule of prices, announcement of which is expected momentarily, putting into effect their efforts to stabilize the market. Meanwhile, galvanized sheets generally are 2.60c, base, Pittsburgh; and black, 2.00c to 2.10c. Specifications from the automotive industry have been reduced sharply, though sheet mill operations on tonnage previously released have not yet shown a corresponding reduction. A slight improvement is noted in demand for refrigerator stock.

San Francisco—Wheeling Steel Corp., Wheeling, W. Va., has been awarded 199 tons of soft cold-rolled black sheets, box annealed, pickled and oiled, 0.025-inch thick, for the Mare Island navy yard at $9619.88, f.o.b. works. Also 20,000 pounds of black sheets for Norfolk, Va., at 2.3c, delivered, and 56,000 pounds of galvanized for Norfolk at $856.

Birmingham, Ala.—Farm needs for sheets appear large, but the ability to buy is lacking. Demand generally lags.

Still Heads Marquette Co.

An article in the Jan. 23 issue of STEEL regarding the acquisition of the Marquette Tool & Mfg. Co., Clearing, Ill., by the E. W. Bliss Co., Brooklyn, N. Y., referred to R. W. Glasner as former president of the Marquette company. Mr. Glasner still is president of this company in addition to being in charge of Chicago district sales of the E. W. Bliss Co.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Steel Sheets

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.45c to 1.55c
Gary, Ind. Harbor, base	1.60c
Chicago, delivered	1.65c
New York, delivered	1.75c to 1.85c
Birmingham, base	1.60c to 1.70c
Philadelphia, delivered	1.71c to 1.81c

BLUE ANNEALED No. 9-10

Pittsburgh, base	1.60c to 1.70c
*Chicago, district mills	1.70c to 1.80c
Chicago, delivered	1.85c
Philadelphia, delivered	1.86c to 1.96c
New York, delivered	1.90c to 2.00c
St. Louis, delivered	2.04c
Birmingham, base	1.75c to 1.85c
San Francisco c.i.f.	2.32½c

HOT ROLLED ANNEALED No. 24

Pittsburgh, base	2.00c to 2.10c
*Gary, Ind. Harbor, base	2.10c
*Chicago, delivered	2.15c
New York, delivered	2.30c to 2.35c
Philadelphia, delivered	2.26c to 2.31c
Birmingham, base	2.15c to 2.25c
St. Louis, delivered	2.34c to 2.44c
San Francisco, c.i.f.	2.85c
Detroit, delivered	2.18½c

GALVANIZED No. 24

Pittsburgh, base	2.50c to 2.60c
*Gary, Ind. Harbor, base	2.60c to 2.70c
*Chicago, delivered	2.65c to 2.75c
Philadelphia, delivered	2.91c
New York, delivered	2.95c
Birmingham, base	2.70c to 2.80c
St. Louis, delivered	2.94c
San Francisco, c.i.f.	3.50c

AUTOBODY No. 20

Pittsburgh, base	2.45c

FURNITURE

Pittsburgh, No. 10 heavy	2.40c to 2.50c
Pittsburgh, No. 20 light	2.90c to 3.00c

TIN MILL BLACK No. 28

Pittsburgh, base	2.30c
*Gary, base	2.40c
*St. Louis, delivered	2.59c

HEAVY COLD ROLLED No. 10

Pittsburgh, base	1.90c
Gary, Ind. Harbor, base	2.00c to 2.10c
Chicago, delivered	2.05c to 2.15c
Philadelphia, delivered	2.11c to 2.16c
New York, delivered	2.15c to 2.20c

COLD ROLLED No. 20

Pittsburgh, base	2.30c
Gary, Ind. Harbor, base	2.40c to 2.50c
Chicago, delivered	2.45c to 2.55c
Philadelphia, delivered	2.56c to 2.61c
New York, delivered	2.65c

Wire Products

(Prices apply on carload lots. Mixed carloads 10 cents higher with 10% discount off extras; joint carloads 10 cents higher with no discount from extras; pool carloads 20 cents up; less carloads 30 cents up.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$1.85
Cement coated nails	1.85
Galvanized nails	3.35

(Per pound)

Polished staples	2.55c
Galvanized fence staples	2.80c
Barbed wire, gal.	2.35c
Annealed fence wire	2.25c
Galvanized wire	2.60c
Woven wire fencing (base column, carloads)	$50.00

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.10c
Spring wire	3.10c

Chicago and Anderson, Ind., $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Steel Plates

Pittsburgh, base	1.60c
New York, delivered	1.70c to 1.80c
Philadelphia, del.	1.59½c to 1.69½c
Boston, delivered	1.82c to 2.02c
Buffalo, delivered	1.85½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Birmingham, Ala. base	1.75c
Coatesville, Pa., base	1.50c to 1.60c
Pacific Coast, c.i.f.	2.00c
St. Louis, delivered	1.94c

Structural Shapes

Pittsburgh, base	1.60c
Philadelphia, delivered	1.65c to 1.75c
New York, delivered	1.77c to 1.87c
Boston, delivered	1.90½c to 2.00½c
Chicago, base	1.70c
Cleveland, delivered	1.78½c
Lackawanna, N. Y., base	1.70c
Birmingham, Ala., base	1.75c
Pacific Coast, c.i.f.	2.10c
Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.70c
Birmingham, Ala., base	1.75c
Lackawanna, N. Y., base	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base	1.65c
Philadelphia, delivered	1.91c
New York, delivered	1.95c
Boston, delivered	2.02c
Pittsburgh, cold finish	1.70c
Pittsburgh, forg. qual.	1.75c and 1.85c
San Francisco, c.i.f.	2.10c

RAIL STEEL

*Pittsburgh, Buffalo, Chicago, St. Louis	1.30c
Eastern mills	1.30c

IRON

Chicago, base	1.60c to 1.65c
New York, delivered	1.85c to 1.90c
Philadelphia, delivered	1.81c to 1.86c
Pittsburgh, refined	2.70c to 4.20c

REINFORCING

*Billet, mill lengths, Chicago, Pittsburgh, Buffalo	1.40c
Do Cleveland	1.45c
Do Detroit	1.60c
Chicago, rail steel	1.20c to 1.30c
Philadelphia, cut lengths	1.81c

Cold-Finished Bars, Shafting

Base Pittsburgh for one size, shape and grade for shipment at one time to one destination

10,000 to 19,999 pounds	1.70c
20,000 to 59,999 pounds	1.65c
60,000 to 99,999 pounds	1.60c
100,000 pounds and over	1.57½c

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel Sheets, 35c; plates, 31c; bars, 28c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Tin and Terne Plate

Per 100-pound box, Pittsburgh

Tin plate, coke base, cont.	$4.25
Tin plate, coke base, stock	3.75
Long ternes, 24 unassorted	2.70c to 2.80c

Gary, Ind., base 10 cents higher

Alloy Steel

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O. Base, 2.45c to 2.65c. Differentials to various classes of consumers

S.A.E.	Alloy Diff.	4600 .20 to .30 Mo.	1.25-1.75 Ni. 1.05
2000	0.25	5100 .80 - 1.10	
2100	0.55	Cr.	0.45
2300	1.50	5100 Cr.	
2500	2.25	spring	0.20
3100	0.55	6100 bars	1.20
3200	1.35	6100 Spring	0.95
3300	3.30	Cr., Ni., Van.	1.50
3400	3.20	Carbon van.	0.95
4100 .15 to .25 Mo.	0.50	9250 (flats)	0.25
		9250 (rds., sq.)	0.50

Strip, Hoops, Bands

Hot-rolled strip up to 23 15/16 in. wide Pitts.	1.45c
Do., Chicago	1.55c
Do., del. Philadelphia	1.76c
Do., del. New York	1.80c
Cooperage hoop, Pitts.	1.55c to 1.60c
Do., Chicago	1.65c to 1.70c
Cold roll, strip, Pitts., Cleve.	1.80c to 2.00c
*Worcester, 3 tons or over	2.10c

Rivets, Wrought Washers

Struc., c.l., Pitts-Cleve.	2.25c
Struc., c.l., Chicago	2.35c
7/16-in. and smaller, Pitts. Chicago, Cleveland	70, 10 and 10 off
Washers, c.l., Pitts. dist.	6.50 to 6.75 off
Do., Chicago district	7.00 to 6.75 off

Rails, Track Material

Standard rails, mill	$40.00
*Relaying Rails, Pitts., 20 to 45 lbs.	$20.00 to 22.00
50 to 75	$16.00 to 18.00
80 to 100	$20.00 to 21.00
Light rails, 25-45, mills	$30.00
Light rails, Chicago	$32.00
Angle bars, mills	2.55c
Spikes, railroad, mills	2.40c
Spikes, boat, barge, Pitts.	2.65c
Track bolts, Chicago	3.50c
do., standard, jobbers	73 off list
Tie plates, Pittsburgh	$35.00
Tie plates, Chicago	$35.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	75 off
Rolled thread ½ x 6 and smaller	75 off.
Eagle list	75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	75 off
Tire bolts	60 and 10 off

Stove bolts, 75, 25 and 10 off in pkgs.; 86 off in bulk, 5000 or more of a size. Rolled thread machine bolts, ½ x 6 and smaller 75 off.

NUTS

Semifinished	75 off

HEXAGON CAP SCREWS

Milled	80-25 off
Upset 1 in. diam. and smaller	80-25-10 off

SQUARE HEAD SET SCREWS

Upset, 1 in. and smaller	75-10-10 off
Headless set screws	75-10 off
Upset, larger than 1 in.	75-10 off

Cut Nails, Piling

Cut nails, c.l. Pittsburgh	$2.50
Do., less carloads, 5 kegs or over	$2.90
Less than 5 kegs	$3.05
Steel sheet piling, Pitts.	1.90c

Bars

Uneven Demand Limits Output At Pittsburgh—Chicago Mills Hold Gains—Prices Steady

BAR PRICES, PAGE 35

Pittsburgh—A leading bar mill here remains closed and failure of merchant bars to feature any prominent demand from automotive or general manufacturing customers has placed greater competition in the reinforcing bar market. The latter has been under especially marked competition and in fact, all one leading bar mill here had for rolling last week was a 700-ton reinforcing bar order, indicating the absence of merchant bar demand. In general, 1.60c, Pittsburgh, applies for merchant bars. The alloy bar situation shows no developments other than small steady automotive releases.

New York—Bars are slightly more active at 1.60c, Pittsburgh, unchanged.

Philadelphia—Steel bar demand is slightly better in small lots, with the price firm at 1.60c, Pittsburgh.

Chicago—While without additional improvement, soft steel bar orders are holding recent gains. Automotive releases are fairly steady and relatively heavier than business from other large consumers. Farm implement manufacturers take only small lots and offer little hope for much betterment. Prices are holding fairly well, 1.70c, Chicago, being the usual market for soft steel bars, with rail steel 1.50c. Bar iron generally is 1.60c.

Cleveland — Miscellaneous steel bookings here for February, of which commercial steel and alloy steel bars constitute a large proportion, show a substantial gain over the January tonnage. Some of the automotive consumers, notably Chevrolet and Chrysler, continue with liberal bar releases. A mild seasonal improvement in requirements for agricultural implements also is noted. Commercial bars are firm at 1.65c, base, Cleveland.

Tin Plate Operations Decline to 45-50

Tin Plate Prices, Page 35

Pittsburgh—At 45 to 50 per cent, tin plate operations on the average are a little easier this week after a 50 per cent rate a week to ten days ago. Those mills operating at the higher rates are making stock, as current specifications including those for early second quarter are less than the plate produced by present operations of 45 per cent. Tin plate holds at $4.25 per base box, and the larger producers are adhering to this level.

Cold-Finished Buying Holds January Rate

Cold Finished Prices, Page 35

Pittsburgh—February, from the standpoint of late last week, is calculated to show no change in orders or shipments of cold-finished steel bars, in comparison with January. Automotive accounts are buying relatively more than miscellaneous users of cold finished steel but the former have felt the effects of bank difficulties in Michigan and receivership for one important automobile manufacturer so that their specifications have not expanded during February as had been expected six weeks ago. No change is reported in the base price, which continues 1.70c, Pittsburgh, for 5 to 10-ton lots.

Globe-Union Mfg. Co., Milwaukee, distributed $45,000 as a holiday bonus among 1100 employes. It has been operating five days a week the past year.

Plates

Barge and Drydock Projects Bring Fair Tonnages—General Demand Has Little Volume

PLATE PRICES, PAGE 35

Chicago—Plate orders show occasional small gains from miscellaneous consumers. Large tonnages generally are absent although some improvement in tank work is looked for shortly. The water line contemplated for Denver has been abandoned for the present. Oil and gas pipe line orders are slow, with some prospective work expected to develop over the next several months. Plate requirements of railroads continue light.

Boston—Under 1.60c, Coatesville, on the larger lots of plates is being done, but on the general run of business that price holds. Demand is light and orders small, although fairly numerous.

New York—Oil, railroad and tank buying are light with inquiry smaller than recently. There is less sharp shading and 1.60c, Coatesville, Pa., is more general.

Philadelphia — Inquiry for steel plates is more active, with prices usually 1.50c to 1.60c, Coatesville, Pa., with occasional irregularities on large lots. Plate mills are figuring a navy floating drydock for San Diego, Calif. New bids will be taken on a Pennsylvania railroad ferryboat for Cape Charles service, requiring 1000 tons of plates, shapes and bars.

Cleveland—Plate mills here continue to operate intermittently, mainly on railroad specifications. One of the local mills will be on four days this week. Lists showing steel awards throughout the country give evidence of larger plate demands recently for tanks, barges and miscellaneous construction work, but here only small inquiries and orders are noted. Boiler fabricators have not purchased material in quantity for several weeks. On small lots, the price is firm at 1.60c, base, Pittsburgh.

Pittsburgh—On oil barge, 84 x 20 x 5 feet, requiring 60 tons of plates and shapes, is being built for the Sterling Oil Co., St. Marys, W. Va., by Marietta Mfg. Co., Pt. Pleasant, W. Va. It will be of 50,000-gallon capacity and represents the only recent barge work closed. The Marietta Mfg. Co. also has under construction two floating boathouses for the Huntington, W. Va., engineers and several other minor repair jobs for both Huntington and Cincinnati engineers. A tonnage of plates will be required for 100 narrow-gage railroad cars which Koppel Industrial Car & Equipment Co., Koppel, Pa., will build. Plate mills here have little backlog and prospect of early business is far from encouraging. The price of 1.60c, Pittsburgh, shows no major change.

Contracts Placed

1200 tons, tanks for Sinclair Oil Co., Marcus Hook, Pa., to Chicago Bridge & Iron Works, Chicago.

750 tons, tanks for Frontier Fuel & Oil Co., Buffalo, to McClintic-Marshall Corp., Bethlehem, Pa.

747 tons, mostly black, navy, various points, bulk to Worth Steel Co., Claymont, Del.; bids Jan. 10. Part of requirements also to Youngstown Sheet

& Tube Co., Central Iron & Steel Co., and Alan Wood Steel Co. Included 44 tons of floor plates and 32 tons of galvanized plates.

200 tons, standpipe, Washington, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

150 tons, tank, Carthage, Mo., to R. D. Cole Co., Newman, Ga.

Contracts Pending

1500 tons, tunnel lining, contract No. 5, San Francisco-Oakland bridge; bids March 7.

Unstated tonnage, two pontoons with pivot bearing pipe carriers, engineer, Kansas City, Mo., Chicago Bridge & Iron Co., low, $2270; Treadwell Construction Co., Midland, Pa., low on two sections 23¼-inch electric welded steel pipe, $460; bids Feb. 9.

Sees Early Improvement in Depressed Metal Situation

(*Concluded from Page 27*)

per cent chromium alloys developed some interesting possibilities, according to Messrs. Wright and Mumma. In the first place, these steels can be soft annealed to develop properties similar to those of mild carbon steels and therefore suitable for equipment where severe cold work is applied during fabrication. On the other hand, it was contended, some steels with remarkably high yield points and tensile strengths combined with excellent ductility and impact toughness can be produced by simple air-hardening treatments.

Some observations on the effects of inclusions on the tensile and dynamic properties of certain ferrous materials were made by F. R. Hensel and T. F. Hengstenberg, research laboratories, Westinghouse Electric & Mfg. Co. These include the observation that the material containing inclusion stringers shows large directional differences in physical properties, particularly in elongation, reduction of area and impact strength. By comparing wrought iron with steel containing "ghosts" it was shown that both types of inclusion stringers have a similar effect on the physical properties.

"Hot-hardness of High-speed Steels and Related Alloys" was the subject of a paper by Oscar E. Harder, assistant director, and H. A. Grove, fellow, respectively, of the Battelle Memorial Institute, Columbus, O. From the somewhat limited data available, it was pointed out, there appears to be at least a first order approximation to a correlation between the hot hardness as determined by the mutual-indentation method and the cutting efficiency of high-speed steels.

Railroads

Rail and Other Buying Slow to Come Out—Small Lots Are Placed—Export Cars Placed

TRACK MATERIAL PRICES, PAGE 35

Hesitation marks the steel rail market and other steel needs are not being covered except in a small way. Rail needs seem imminent and inquiry is expected before long by some important lines. The Erie's formal inquiry for 30,000 tons of rails seems likely to appear at any time. St. Louis & San Francisco railroad has released 1000 tons of 110-pound rails to Tennessee Coal, Iron & Railroad Co. on a deferred order.

Railroads with headquarters at Cleveland have ordered 150 to 175 tons of track fastenings. Norfolk & Western railroad will close March 1 on 100 wrought steel wheels. Missouri, Kansas & Texas is inquiring for bids on four lounge cars. Koppel Industrial Car & Equipment Co., Koppel, Pa., has booked an order for 100 narrow-gage sisal cars for shipment to Porto Rico. The Pennsylvania has closed on its first structural tonnage for the year.

Steel for general use and repairs is being taken in small lots, only as necessity arises. Releases on contracts for track fastenings are being filed steadily as spring work opens.

Colorado Fuel & Iron Co. has started its rail mill at Pueblo, Colo., on a five-day six-hour schedule, after being idle nearly a year, during which interval the mill has been overhauled. Rails for the Santa Fe railroad will furnish the first rollings.

Car Orders Placed

Export for unstated customer in Haiti, 100 narrow-gage sisal cars, to Koppel Industrial Car & Equipment Co., Koppel, Pa.

Car Orders Pending

Missouri-Kansas-Texas, four lounge cars.

Wire Sales Steady; Nail Price Faces Test

Wire Prices, Page 35

Pittsburgh—Wire and nail specifications last week exhibited little variation from the weekly average of January. Nails continue unsettled with spot business going at $1.85 in straight carloads but some tonnage is being billed at $1.80. Pittsburgh Steel Co., Pittsburgh, has taken an order for about 300 tons of fencing for the Sunnyvale, Calif., naval station. The market on plain wire for manufacturing purposes remains 2.10c with spring wire 3.10c. As the nail galvanizing extra continues $1.50, cement coated nails are quoted at $3.35 per keg.

Chicago—Shipments of wire and wire products are well maintained and activity is moderately better than a month ago. The recent price advance in some products has yet to be thoroughly tested but producers look for a higher market with second quarter contracting. Wire nails currently are quoted $1.90, Chicago, with plain wire 2.15c. Shipments to the automotive industry are fairly steady and movement of wire products from jobbers stocks is retarded by quiet in building construction and the unfavorable situation in agricultural districts.

Worcester, Mass.—Demand for wire and specialties has gained slightly with a firming in price on some products.

New York—Firmer prices on wire products and rods have brought a slight gain in buying but the volume still is light. A test of prices is expected on second quarter contracts.

Philadelphia—Eastern nailmakers have adopted $1.85 Pittsburgh, which will receive a test when quarterly contracts come to be made.

Cleveland—Seasonal ordering of some wire products is noted by sellers here, though the improvement is mild. Prices are unchanged from the bases recently established.

Ore Consumption Gains

Iron Ore Prices, Page 43

Cleveland—Lake Superior iron ore prices are not in active consideration at this time, no new demands for the season having appeared. Consumption in January increased slightly, as shown by the following report from the Lake Superior Iron Ore association:

	Tons
Consumed in December	630,115
Consumed in January	661,116
Increase in January	31,001
Consumed in January, 1932	1,153,560
On hand at furnaces Feb. 1, 1933	25,680,542
On Lake Erie docks Feb. 1, 1933	5,131,577
Total at furnaces and Lake Erie docks Feb. 1, 1933	30,812,119
Total Feb. 1, 1932	36,893,313

Structural Shapes

Awards Continue Light—Postoffice Projects More in Evidence—Bids to Close Early in March on Major Portion of 117,000 Tons for San Francisco Bridge

STRUCTURAL SHAPE PRICES, PAGE 35

New York—Structural inquiry is heavier, aided by 3500 tons for a viaduct at Newark, N. J. A Massachusetts contractor is low on the Stapleton, Staten Island, N. Y., marine hospital, 2000 tons. Slowness in closing on more than 15,000 tons in large projects is subjecting plain material and fabricated steel prices to severe tests.

Pittsburgh—Considerable interest in the structural market here is diverted toward the San Francisco-Oakland bridge, which as previously noted in STEEL will require 117,000 tons. Bids on the major part of this job go in March 7 and 8. The 3000-ton Columbus, O., postoffice which was bid a week ago attracted figures from over 40 general contractors. This job takes approximately 70 per cent standard structural shapes and only 30 per cent of wide-flange material. Low bids have been announced on several Pennsylvania state bridges, and the Pennsylvania railroad is inquiring for a 200-ton bridge at Norristown, Pa. Plain material is firm at 1.60c, Pittsburgh.

The Wheeling Steel Corp. is moving some Steubenville rolling mill equipment to the Yorkville works and has placed a small shape order for new mill bays.

Boston—Bids close March 28 on the Cambridge, Mass., postoffice, the largest new government project active. Contracts for the naval war college, Newport, R. I., and the New London, Conn., postoffice, have been placed. Plain material is fairly steady at 1.60c, Pittsburgh.

Philadelphia — The market for plain material continues firm at 1.60c, nearest mill, or 1.65c, Philadelphia. Demand is light.

Cleveland—An Ohio letting scheduled for March 10, the first in this state this year, will provide bridge contracts requiring approximately 350 tons of shapes. For a bridge in Akron, O., 125 tons have been placed. New York and Chicago general contractors are low on alternative types of construction of the Columbus, O., postoffice, calling for 3000 tons of shapes. Several small lots for private projects were closed during the week. Some fabricators here estimate vacant commercial office space in Cleveland now is less than 20 per cent of total area, concluding that commercial building operations will expand with improvement in general business.

Chicago—Structural awards involve only a few small bridges with new inquiry slow to appear. General activity continues at a low ebb and fabricators see little increase in proposed work in early prospect. Awarding of the general contract for the St. Paul postoffice is expected shortly.

St. Louis—Plans have been approved for the St. Louis federal building, requiring 6500 tons of shapes. The state highway commission is taking bids March 1 on bridges, needing 1500 tons. River improvement work promises to absorb larger steel tonnages this year.

Contracts Placed

700 tons, deck girder bridge for Southern Pacific railroad, to American Bridge Co., Pittsburgh, through Columbia Steel Corp., San Francisco.

550 tons, lock and dam 5, Green River, Ky., for United States engineer, Louisville, Ky., to Stupp Bros. Bridge & Iron Co., St. Louis; Frazier-Davis Construction Co., St. Louis, general contractor. Several hundred tons of piling, pipe and concrete bars included in project.

475 tons, postoffice, Charlotte, N. C., to Virginia Bridge & Iron Co., Roanoke, Va.; Ralph Sollitt & Sons Co., South Bend, Ind., general contractor.

450 tons, building, Chesapeake & Potomac Telephone Co. of Virginia, Roanoke, Va., to Virginia Bridge & Iron Co., Roanoke; Doyle & Russell, Richmond, general contractor.

300 tons, Briggs Memorial hospital, Ithaca, N. Y., to Shippers' Car Line Inc., Milton, Pa.; John Johnson Construction Co., general contractor.

275 tons, sports building, Vassar college, Poughkeepsie, N. Y., to Belmont Iron Works, Philadelphia.

270 tons, highway bridge, Red Bud, Ill., to Wisconsin Bridge & Iron Co., Milwaukee.

252 tons, viaduct, Rock Island railroad, Tarrant county, Texas, to North Texas Iron & Steel Co., Fort Worth; Butcher & Sweeney, Fort Worth, general contractors.

250 tons, Chicago, Burlington & Quincy railroad bridge alterations, Ottawa, Ill., to American Bridge Co., Pittsburgh.

220 tons, highway bridges, New Mexico, to Kansas City Structural Steel Co., Kansas City, Mo.

220 tons, highway bridge, Paducah, Ky., to Virginia Bridge & Iron Co., Roanoke, Va.

190 tons, New York Central railroad bridge, Poughkeepsie, N. Y., to American Bridge Co., New York.

190 tons, floor reconstruction, state highway bridge, Warren county, Pennsylvania, to Lehigh Structural Steel Co., Allentown, Pa.

180 tons, building for Frank E. Shattuck Co., Newark, N. J., to A. E. Smith Co., Plainfield, N. J.

175 tons, state bridge, 5239 near Rushford, Minn., to McClintic-Marshall Corp., Bethlehem, Pa.; A. Guthrie & Co. Inc., St. Paul, contractor. Paper, Calmenson & Co., St. Paul, awarded 42 tons of concrete reinforcing bars. Lakeside Bridge Co. awarded 45 tons of structural steel.

160 tons, subway, Newark, N. J., to Selbach-Meyer Co., Newark.

160 tons, Chehalis, Wash., postoffice, and crane and warehouse for lighthouse department, Ketchikan, Alaska, to Isaacson Iron Works, Seattle.

130 tons, highway bridge, Fullerton, Ky., to McClintic-Marshall Corp., Bethlehem, Pa.

100 tons, or more shapes and concrete bars, postoffice, Waterbury, Conn., shapes to Bellefonte Engineering & Construction Co., Bellefonte, Pa.; bars to Sweet's Steel Co., Williamsport, Pa.; Tremaglio Bros., Bellefonte, Pa., general contractor.

100 tons, mill building for Standard Tin Plate Co., Canonsburg, Pa., to Fort Pitt Bridge Co., Pittsburgh.

Awards Compared

	Tons
Awards, week ended Feb. 25	**5347**
Awards, week ended Feb. 18	**5,185**
Awards, week ended Feb. 11	**7,904**
Awards this week in 1932	**6,732**
Av. weekly awards, 1932....	**14,285**
Av. weekly awards, 1933....	**9095**
Av. weekly awards, Jan.	**8,143**
Total awards to date, 1932..	**122,670**
Total awards to date, 1933	**81,857**

Contracts Pending

55,488 tons, contracts No. 3 and No. 7, San Francisco-Oakland bridge, including 3400 tons of nickel steel; bids March 8.

7000 tons, state highway bridge, Hartford, Conn.

6500 tons, federal building, St. Louis; plans approved. Mauran, Russell & Crowell, St. Louis, architects.

5000 tons, postoffice, St. Paul; Fleishner Engineering & Construction Co., Chicago, low.

4000 tons, postoffice, Columbus, O., Wills, Taylor & Mafera Corp., New York, low, limestone.

3500 tons, viaduct, route 21, section 1, from pier 15 to Poinier street, Newark, N. J., over yards of Pennsylvania railroad; bids March 13. Two truss spans and 12 girder spans, total length 1550 feet.

2500 tons, toll bridge across Missouri river at Kansas City, Kans. R. F. C. to purchase $600,000 worth of bonds from Regional Bridge Co., Kansas City, Mo. Bridge and approaches estimated to cost $825,000.

2000 tons, marine hospital, Stapleton, Staten Island, N. Y., Dyer Construc-

tion Co., Medford, Mass., low.

1500 tons, contract No. 5, Yerba Buena island crossing, San Francisco-Oakland bridge; bids March 7.

1500 tons, state bridge work in Missouri; bids March 1.

900 tons, postoffice, Nashville, Tenn., Frank Messer & Sons Inc., Cincinnati, low.

800 tons, postoffice, Phoenix, Ariz.; bids March 21.

500 tons, Phelphs vocational school, Washington; Catalano Construction Co., Baltimore, general contractor.

500 tons, piling, Peoria, Ill., breakwater; Union Bridge & Construction Co., Kansas City, Mo., low on general contract.

500 tons, estimated, postoffice, Cambridge, Mass.; bids March 28.

450 tons, highway bridges, Nebraska.

350 tons, track leveling work, Atchison, Topeka & Santa Fe railroad.

300 tons, sheet piling, pier and quays, Pearl Harbor, T. H. specification 7224; bids soon.

300 tons, shapes and concrete bars, postoffice, Union City, N. J.; bids March 15.

300 tons, caissons, naval hospital, Philadelphia; John McShane, Philadelphia, general contractor.

200 tons, shapes and bars, postoffice, San Jose, Calif., W. J. Ochs, San Jose, low, terra cotta; Rosen & Fischel, San Francisco, low, cement plaster.

200 tons, bridge, Norristown, Pa., for Pennsylvania railroad.

200 tons, Collins & Aikman Co. factory building, Philadelphia.

175 tons, surgical unit and laundry building, marine hospital, Memphis, Tenn.; bids March 22.

150 tons, postoffice, Wausau, Wis.

150 tons, highway bridge, Pocahontas, Ark.

150 tons, postoffice, Bloomfield, N. J.; Agostini Bros. Building Corp., New York, low; alternate on asphalt blocks, Schurman Construction Co., Passaic, N. J., low.

125 tons, structurals and gates, Cedars dam, Kimberly, Wis.; also five tons wedge bolts, piling and other material; United States engineer; bids March 10.

120 tons, shapes and bars, postoffice, Waynesboro, Pa.; bids March 16.

106 tons, state highway bridge, Elk county, Pennsylvania; Lehigh Structural Steel Co., Allentown, Pa., low.

100 tons, postoffice, Visalia, Calif.; Peek Construction Co., Kansas City, Mo., low.

100 tons, piling, sewer work, Duluth; bids Feb. 24.

100 tons, postoffice, Northfield, Minn.; bids March 28.

Shape Bookings Rise

Fabricated structural steel shipped by 146 companies representing 75 per cent of capacity in January totaled 49,185 tons, while bookings were 72,251 tons. During the fourth quarter, 150 companies representing 73 per cent of the industry shipped an average of 59,134 tons per month and booked a monthly average of 63,203 tons. These statistics are by the American Institute of Steel Construction, New York.

Concrete Bars

Price Announcement Expected This Week to Stabilize Market in Some Districts—Effects of Keen Competition Widely Noted — Week's Awards Show Improvement

REINFORCING BAR PRICES, PAGE 35

New York—New concrete bar requirements include 1530 tons for a Newark, N. J., viaduct and New Jersey highways, but fresh inquiry from other directions is light. Prices are easy, being subjected to further pressure on several large tonnages about to be placed .

Boston—Concrete bar demand is light with prices weak. New inquiry is limited to small lots.

Pittsburgh—An important announcement is expected this week on the price of concrete bars. The mill base price is being reduced, and the distributors' price likewise, although on the latter some difficulty has arisen as to the proper spread over the mill base. Heretofore this has been averaging about $2 a ton, but distributors are asking for a wider margin. Mill specifications are made up of small lots.

Cleveland—Though the anticipated price announcements on concrete bars in some districts apparently will be a reduction from the nominal figures noted recently, they will in reality be an advance over the low prices actually done in competitive districts, according to some bar producers. Where competition has forced billet steel, mill lengths, down to 1.10c to 1.15c, an effort will be made to stabilize the market at 1.30c to 1.40c. Distributors also are seeking to steady prices. Demand here is quiet, with highway work still in abeyance.

Chicago—Concrete bar prices are slightly firmer, fewer concessions being noted. With mills adhering to a 1.30c, base, on billet bars the distributor's quotation is expected to be established around 1.50c or 1.60c. Rail steel bars are 1.20c, mills. About 1000 tons have been distributed for Illinois road work.

Awards Compared

	Tons
Awards, week ended Feb. 25	**5848**
Awards, week ended Feb. 18	**924**
Awards, week ended Feb. 11	**3,039**
Awards, this week, 1932....	**2,320**
Av. weekly awards, 1932....	**3,920**
Av. weekly awards, 1933....	**3505**
Av. weekly awards, Jan.	**4,348**
Total awards to date, 1932..	**48,874**
Total awards to date, 1933	**31,549**

Contracts Placed

1700 tons, eleven buildings at Fort Miley, Calif., to Gulf States Steel Co., Birmingham, Ala.

1000 tons, Illinois road work, to various distributors.

960 tons, three barrack buildings, Fort Sill,Oklahoma, to Concrete Engineering Co., Oklahoma City, Okla., Jerome A. Utley, Detroit, general contractor.

600 tons, state hospital, Gowanda, N. Y., to Kalman Steel Corp., Bethlehem, Pa.

518 tons, viaduct, Rock Island railroad, Tarrant county, Texas, to North Texas Iron & Steel Co., Fort Worth; Butcher & Sweeney, Fort Worth, general contractors.

300 tons, including some piling, bridge, Choptank river, Maryland to Kalman Steel Corp., Bethlehem, Pa.

300 tons, Biggs Memorial hospital, Ithaca, N. Y., to E. T. Edwards, Columbia, Pa.; John Johnson Construction Co., general contractor.

150 tons, postoffice, Charlotte, N. C., to Southern General Fireproofing Co.; Ralph Sollitt & Sons Construction Co., South Bend, Ind., general contractor.

120 tons, bridge at Knights Landing, Calif., to Pacific Coast Steel Corp., San Francisco.

100 tons, Washington highway projects and Seattle port terminals, to Northwest Steel Rolling Mills Inc., Seattle.

100 tons, or more, concrete bars and piling, bridge, Three-Mile creek, Montgomery-Mobile highway, Alabama; bars to Gulf States Steel Co., Birmingham, and piling to Jones & Laughlin Steel Corp., Pittsburgh; J. S. Walton, Mobile, general contractor.

Contracts Pending

2458 tons, contracts No. 3, San Francisco anchorage, San Francisco-Oakland bridge, 1400 tons; contract No. 7, East Bay superstructure, 1058 tons; bids March 8.

2200 tons, contract No. 5, Yerba Buena island crossing, San Francisco-Oakland bridge; bids March 7.

1000 tons, pier and quays at Pearl Harbor, T. H., specification 7224; bids soon.

750 tons, mesh, state highway work in Missouri; bids March 1.

650 tons, viaduct, route 21, section 1, from pier 16 to Poinier street, Newark, N. J., over yards of Pennsylvania railroad; bids March 12.

600 tons, apartment, Newark, N. J.; Walter Kidde Co., low.

200 tons, ward for General hospital,

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Mansfield Electrical Sheets are the standard of our many pleased customers.

Because **they are well made, carefully treated, sheet inspected and thoroly tested before shipment,**

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EMPIRE STEEL CORPORATION
MANSFIELD
OHIO

Sales Offices:

New York, Dayton, Cleveland, Indianapolis Chicago, Detroit, St. Louis, San Francisco

San Francisco; new bids March 8.

165 tons, highway, route 29, section 3A, Empire street to Hilldale place, Essex and Union counties, New Jersey; bids March 13. Work also includes one 75-foot electric railroad bridge and extensions to retaining walls of Lehigh Valley railroad bridge.

115 tons, sewage disposal plant, Ambridge, Pa.; Patterson Engineering Co., Detroit, low on general contract.

115 tons, including 72 tons of reinforcing bars and 43 tons shapes, highway and structures, Attala county, Mississippi; bids in.

Unstated tonnage, highway, route 29, Essex and Morris counties, New Jersey.

Details of Production Conference Announced

Speakers and their subjects have been announced for the conference on "re-engineering for economical manufacture," to be held March 23-24 at Case School of Applied Science, Cleveland, as announced originally in STEEL, Feb. 13, p. 25. Purpose of the conference is to examine ways of reorganizing production procedure to promote more effectiveness of effort and the utilization of recent developments.

E. S. Ault, associate professor of mechanical engineering, is chairman, and the Cleveland Engineering society and Cleveland branch of the American Society of Mechanical Engineers are co-operating in conducting the conference. Invitations have been sent to 6000 plant engineers to attend the two-day meeting. Tentative list of papers is as follows:

"Production Development — Whither Bound?" by E. L. Shaner, editor, STEEL, Cleveland.

"Redesign of the Product To Increase Appeal to the Purchaser," by R. E. Hellman, chief electrical engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

"Developments in Manufacturing Processes," by D. Levinger, engineer in manufacturing, Western Electric Co., New York.

"Net Profits from Selection of Equipment," by H. P. Bailey, assistant to the president, Warner & Swasey Co., Cleveland.

"Metal Forming To Eliminate Machining," by Charles D. Harmon, National Machinery Co., Tiffin, O.

"Place for Stampings in the Product," by J. K. Olsen, Stewart-Warner Corp., Chicago.

"Influence of Welding on Design in Production," by Robert E. Kinkead, consulting engineer on welding, Cleveland.

"Manufacturing Quantities for Small Industries," by J. C. Wattleworth, factory manager, Vichek Tool Co., Cleveland.

"Operation Study," by R. M. Blakelock, General Electric Co., Schenectady, N. Y.

Strip

More Orders of Small Size Coming Out—Automotive Lots Show Some Shrinkage

STRIP PRICES, PAGE 35

Pittsburgh—The first full effects of unsettled Detroit conditions were felt by strip manufacturers last week when automotive specifications for both hot and cold-rolled strip showed a rather pronounced decline. Hot-rolled strip is holding up fairly well at 1.45c base, Pittsburgh, although cold-rolled strip is irregular and easy at 1.90c, Pittsburgh, with occasional small lots taking 2.00c, Pittsburgh.

Cleveland — Strip specifications from the automotive industry have been reduced sharply, though Chevrolet and Chrysler continue to take material in fairly good volume. The reductions in automotive tonnage, compared with the early weeks for February, are as much as 40 per cent, some mill interests report. This loss is not offset by moderate improvement in some other lines. Prices are steady.

Chicago—Strip specifications are steady. Orders have increased more in number than in tonnage over recent weeks, with some small miscellaneous consumers entering the market for the first time in a number of weeks. Automotive business is fairly well maintained with recent changes in tonnage slight. Mill operations are slightly under 20 per cent. Hot-rolled strip generally is quoted at 1.55c, Chicago, although in some outside districts this price occasionally is shaded. Cold-rolled strip generally is 1.90c to 2.00c, Pittsburgh-Cleveland.

Steel Rate Falls to 17, Mid-January Level

Pittsburgh—Steel ingot production here declined three points last week to 15 per cent. One plant maintained a 17 per cent level, while the rate for another leading producer underwent marked curtailment. Decline was due to failure of anticipated releases on business which had been booked some time ago and affected structural and plate business mainly. A leading bar mill here is closed, as is the plant of a prominent wire producer. According to tentative schedules late last week, steel ingot output will be stepped up about two points this week to 17 per cent.

Buffalo—Buffalo district steelworks operated at 19 per cent during the week ended Feb. 25, this rate being a continuance of that of the previous week in spite of expectations that a five point reduction would take place. A curtailment to 14 per cent, with five open hearths operating, is expected for this week.

Youngstown, O.—Steel operations here dropped four points last week to 17 per cent and were expected barely to hold at that level this week. An idle Carnegie open-hearth plant will not resume before March 6. Improvement is seen in March.

Cleveland—Steel ingot production here for the week ended Feb. 25 was at 31 per cent, down from 36½ per cent in the preceding week. Corrigan, McKinney Steel Co., which was operating five furnaces took off two for several days, then went to four. Otis Steel Co. continued with three active, and American Steel & Wire Co. with four. The rate at the close of the week stood at 32 per cent. No change is definitely indicated for the current week.

Operations, week ended Feb. 25	**17**
Operations, week ended Feb. 18	**19**
Operations, week ended Feb. 11	**19**
Operations, one year ago	**25**
High for 1932, Feb. 6	**28.5**
Low for 1932, July 9 & Dec. 24	**12**

Chicago—Steel plant operations tended slightly lower in the past week with ingot production 18 per cent. Six of 36 steelworks blast furnaces continue active, and one merchant stack. Finishing mill operations generally were unchanged, although rail mills were idle.

Birmingham, Ala.—The steel rate here last week was about 17½ per cent, unchanged.

Warehouse Prices Make Some Changes Downward

Warehouse Prices, Page 50

New York—While there has been no notable increase in buying of steel out of warehouse, some jobbers note a slight gain in inquiry. Prices are officially unchanged, but shading continues.

Philadelphia—Jobbers are quotinglarge rivets at 2.25c, Pittsburgh, hot-rolled box annealed sheets at 3.15c, blue annealed at 2.70c and galvanized at 3.50c.

Pittsburgh—One jobber here experienced a fair volume of sales one day last week on bars and small shapes. For other interests last week's demand was no better than the week before. Indications point to February warehouse business here being close to the volume of January. Prices show no change.

Cleveland — Warehouse tonnage booked in February shows little change from that of January. Some of the higher priced materials have been in a little better demand; in that respect "dollar volume" has improved. Prices are steady.

Detroit — Structural rivets have been reduced to $6 per 200 pound keg, with the following quantity extras: Under 200 pounds to 100 pounds, $1 extra; under 100 pounds to 50 pounds, $3; under 50 pounds to 25 pounds, $4; under 25 pounds to 10 pounds, $5; under 10 pounds, $8. Tank rivets are subject to the same quantity extras, the market on this grade being the stated list, less the discount, plus quantity extras.

Cincinnati—Warehouse tonnage for February will show a daily average slightly lower than in January, according to present estimates.

Chicago—Black and galvanized sheets have been reduced $5 a ton to 3.20c for the former and 3.50c for local delivery of galvanized sheets, with outside delivery 3.25c. Sales showed a fairly good increase during the past week, following continued quiet earlier in the month.

St. Louis—There is little change in volume and character of business of warehouses. Weather conditions are more favorable for outdoor work, and the movement of certain items has broadened slightly

Bolt, Nut Demand Steady

Bolt, Nut, Rivet Prices, Page 35

Buying of bolts and nuts shows little change from the January rate, with automotive orders fairly steady, though variable. Orders are in greater number but all are small. Prices are steady and seem likely to be carried over into second quarter without change, though books have not been opened for that delivery. As far as known prices for that period have not been given definite consideration. Railroads are taking only light lots and farm implement manufacturers are ordering sparingly. Jobbers' orders indicate little change in their rate of selling. Bolt and nut prices are based on 75 off list and

Pipe

Two Thousand Tons Placed for Gas Line—Effort Made to Liberalize R. F. C. Loan Interest

PIPE PRICES, PAGE 50

Chicago—With cast pipe activity continuing at a low ebb, producers look to federal aid to provide the stimulus for improved business over coming months. There is some hope for a liberalization in Reconstruction Finance Corp. interest rates to aid proposed work involving pipe. Extensive construction for the Chicago sewage system has been discussed but financing difficulties have yet to be overcome. Developments are lacking on work pending in this district.

Boston—Several thousand tons of cast pipe is being held up, the low bidder on one lot contesting the award of 2100 tons to another foundry. Buying is in small lots but some business is being scheduled for spring. Prices are fairly steady but in some instances $1 under recent quotations.

New York—Cast pipe prices on a few small lots are barely steady. Foundries in the East are hardly averaging 35 per cent operations. Several thousand tons are expected out in this district shortly.

Pittsburgh—Southern Union Gas Co. has placed approximately 34 miles of 8-inch line pipe, about 2000 tons, with Spang-Chalfant & Co. Inc., Pittsburgh. Smaller miscellaneous orders for tubular products appear less frequent than in January. Oil country goods are moving slowly, and standard pipe reflects a hesitant policy on the part of jobbers.

Cleveland—The last of the Cleveland postoffice's miscellaneous steel requirements, 140 tons of pipe for plumbing, has been placed with a valley mill. Tonnage is slow to improve, sales generally being restricted to occasional carloads.

ANOTHER
NEW
ThomaStrip
PRODUCT
ELECTRO
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COLD ROLLED
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THE superior drawing qualities, gauge uniformity and fast production advantages of cold rolled steel for continuous stamping and forming operations are now combined in Thomastrip with the desirable features of tin. . . . The uniform dense electro coating of tin, in dull mat or bright finish, provides protection against corrosion and rust and the necessary bond for application of babbitt or the base for further plating. . . . Light buffing produces a bright luster of appealing appearance comparable to higher cost platings. A Thomas representative will gladly analyze your particular requirements.
HEADQUARTERS FOR SPECIALIZED PRODUCTION COLD ROLLED STRIP STEEL
A product of specialized production, Thomastrip with electro zinc, copper or tin coat, or in plain or bright finish is serving the present day needs of hundreds of manufacturers. . . . Test Thomastrip in your production. Send for samples, now, specifying coat, width, gauge and finish desired.
The THOMAS STEEL CO.
WARREN OHIO

Cast Pipe Placed

300 tons, iron castings, bureau of sewers, Baltimore, to American Brake Shoe & Foundry Co., Baltimore.

264 tons, 4, 6 and 10-inch for Fort Lewis, Wash., to Universal Pipe Co., Birmingham, Ala.; West Coast Construction Co., Seattle, general contractor.

200 tons, 6, 8 and 10-inch, Newburg, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

120 tons, 18 and 24-inch, state highways, New York, to Donaldson Iron Works, Emaus, Pa.; also 78 tons for Long Island work.

110 tons, 18-inch, Westchester county, N. Y., to Donaldson Iron Works, Emaus, Pa.

Steel Pipe Placed

2000 tons, 34 miles of 8-inch line pipe for Southern Union Gas Co., to Spang-Chalfant & Co. Inc., Pittsburgh.

Unstated tonnage, galvanized steel conduit pipe, east and west navy yards, to Laclede Tube Co., St. Louis, total $9232.24, delivered.

Unstated tonnage, cold-drawn annealed seamless steel boiler tubes, navy eastern yards, Michigan seamless Tube Co., South Lyons, Mich., low, $57,651.80, delivered; same firm awarded tubes for Puget Sound, Wash., at $11,500.52, f.o.b. works. Ohio Seamless Tube Co., Shelby, O., low on 547 boil-

(*Please turn to Page 45*)

RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4

Asterisk denotes price change this week

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2	
Chicago, furnace	$15.50
Pittsburgh, dist. furnace..	15.00
Pittsburgh, delivered	15.63 to 16.13
Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.00
Philadelphia, delivered	13.26 to 13.76
Virginia furnace	17.25
Granite City, Ill., furnace	16.50 to 17.50
Buffalo, fur., local del.	16.00
Buff., all-rail, Boston	18.91 to 19.91
Buff., all-rail, Brooklyn	18.90
Buff., all-rail, Newark	17.28
Ala., Bir. fur., local del.	11.00
Ala., Nor. del., Bir. base	10.00
Alabama, del. Chicago	16.01
Alabama, del. St. Louis	14.42
Alabama, del. Cincinnati	13.82
Ala., Phila., dock del.	15.00 to 15.25
Ala., Balt., dock delivery	15.00
Alabama, New York dock	15.50
Ala., Boston dock del.	15.75 to 16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinci.	13.82
Montreal, delivered	23.00 to 23.50
Toronto, delivered	22.10
FOUNDRY, NO. 2X	
Buffalo, fur., local delivery	16.50
Buff., all-rail, Brooklyn	19.40
Buffalo, all-rail, Newark	17.78
Buff., all-rail, Boston	19.91 to 20.91
Virginia furnace	17.75
Eastern, del. Philadelphia	13.76 to 14.26
FOUNDRY, NO. 1X	
Buffalo fur., local delivery	17.50
Eastern, del. Philadelphia	14.26 to 14.76
MALLEABLE	
Valley furnace	14.50 to 15.00
Cleveland fur., local del.	15.00
Pittsburgh dis. fur.	15.00
Pittsburgh, delivered	15.63 to 16.13
Chicago, furnace	15.50
Buffalo, fur., local del.	16.50
Eastern Penna, delivered	14.63 to 18.91
Granite City, Ill., fur.	16.50 to 17.50
Montreal, delivered	24.00
Toronto, delivered	22.60
BASIC	
Pittsburgh, district furnace	14.00
Pittsburgh, delivered	14.63 to 15.13
Eastern Penn., delivered	13.50
Buffalo fur., local delivery	15.50 to 16.00
Montreal, delivered	23.50
Valley, furnace	14.00
BESSEMER	
Valley furnace	14.50 to 15.00
Pittsburgh, furnace	15.00
Pittsburgh, delivered	15.63 to 16.13
LOW PHOS.	
Valley furnace, standard	25.00
Philadelphia, standard	22.76 to 25.79
Copper bear., E. Pa. fur.	20.50 to 21.50
GRAY FORGE	
Valley furnace	14.00
Pittsburgh district furnace	15.00
Pittsburgh, delivered	15.63 to 16.13
CHARCOAL	
Lake Superior, del. Chicago	23.04
SILVERY	

Jackson County, O., fur. in per cents: 6—$18; 7—$18.50; 8—$18.75; 9—$19; 10—$19.50; 11—$20; 12—$20.50; 13—$21.50; 14—$22.50; 15—$23; 16—$24; 17—$25.50.

Pittsburgh and Buffalo furnace: 7 to 10—$19; 15—$21 to $23.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents: 10—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Coke

Prices Per Net Ton

BEEHIVE OVENS	
Connellsville furnace	$1.75
Connellsville foundry	2.25 to 2.50
Connellsville prem. fdry.	4.00 to 4.25
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25
BY-PRODUCT FOUNDRY	
Newark, N. J., delivered	8.21 to 8.31
Chicago, ovens, outside del	7.00
Chicago, delivered	7.75
New England, delivered	10.00
St. Louis, delivered	7.75
Birmingham, ovens	4.00
Indianapolis, delivered	7.75
Ashland, Ky., ovens, Connell., basis	4.50
Portsmouth, O., ovens Connell., basis	4.50
Buffalo, ovens	7.50 to 8.00
Detroit, ovens	8.00
Philadelphia, delivered	8.50

Iron Ore

LAKE SUPERIOR ORE	
Gross ton, 51½%, Lower Lake Ports	
Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40
EASTERN LOCAL ORES	
Cents per unit delivered at Eastern Pennsylvania New Jersey furnaces (Nominal)	
Foundry and basic, 56-63%, contract	7.50
Copper-free low phos. 58-65%	nom.
FOREIGN ORE	
Cents per units, alongside docks Atlantic ports (Nominal)	
Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.00
North African low phos	7.00
Swedish basic, 65%	7.50 to 8.00
Swedish low phos.	8.00
Spanish, North African basic, 50 to 60%	7.00
Tungsten, spot, short ton unit, duty paid	$ 9.75 to 10.00
Newfoundland fdy., 55%	7.00
Chrome ore, 48% gross ton c.i.f.	$15.50 to 16.50

Manganese Ore

(Nominal)

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55%	nominal
South African, 52%	18 to 19 cents
South African, 49-51%	nominal
South African, 44-47%	nominal
Indian, 48-50%	nominal
Brazilian, 46-48%	17 cents

Refractories

FIRE CLAY BRICK	
Per 1000 f.o.b. Works	
First Quality	
Pennsylvania, Ohio, Illinois, Kentucky, Maryland, Georgia, Alabama	$35.00
Missouri	32.00
Second Quality	
Pennsylvania, Ohio, Illinois, Kentucky, Md.	25.00 to 30.00
Missouri	26.00
Georgia, Alabama	30.00
SILICA BRICK	
Pennsylvania	$35.00
Joliet and East Chicago	47.00
Birmingham, Ala	50.00
MAGNESITE BRICK	
Per Net Ton	
Burned, 9 x 4½ x 2½	$61.50
Unburned, 9 x 4½ x 2½	52.00
CHROME BRICK	
Per Net Ton	
F.o.b. shipping point	$42.50
MAGNESITE	
Dead burned grain, net ton, Chester, Pa., or Baltimore bases	38.00
Domes, Chewelah, Wash., base	20.90

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS	
4 x 4-inch base	
Pittsburgh, open-hearth	$26.00
Pittsburgh, bessemer	26.00
Youngstown	26.00
Cleveland	26.00
Philadelphia	31.75
Chicago	26.00
Forging, Chicago	31.00
Forging, Pittsburgh	31.00
Forging, Philadelphia	35.75
SHEET BARS	
Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00
Chicago	28.00
SLABS	
Pittsburgh	26.00
Youngstown	26.00
Cleveland	26.00
WIRE RODS	
Pittsburgh, Cleveland	$35.00
Chicago	36.00
SKELP	
All grades, Pittsburgh	1.50c to 1.60c

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty paid (contracts)	$68.00
do (spot)	61.00
Ferromanganese, deliv. Pittsburgh (contracts)	73.24
do (spot)	66.24
Spiegeleisen, 19-20%, domestic fur. spot†	24.00
Ferrosilicon, 50 per cent, freight all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent	120.00 to 130.00
Spot, $5 a ton higher.	
Silicomang., 2½% carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, for spot delivery	10.00
Ferrotungsten, stand., lb. cont.	0.94 to 1.00
Ferrovanadium, 35 to 40 per cent, per lb. contained, on analysis	2.60 to 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic per ton carload, 23-26% f.o.b. Anniston, Ala.; 24%, $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60 per cent, per lb.	0.95
Cal. Molybdate, lb. cont.	0.80
Molybdate, lb. cont.	0.80

†Carloads. Differentials apply to quant.

Fluorspar

85 and 5 per cent grade

Washed gravel, f.o.b. Ill., Ky., net ton car loads	$10.50
Washed gravel, import duty paid tide, gross ton	16.50

Pig Iron

February Shipments Larger Than January's in Lakes District—Sheridan, Pa., Stack In

PIG IRON PRICES, PAGE 43

Pittsburgh—Several radiator accounts at New Castle, Pa., and as far east as Johnstown, Pa., have been receiving some fair shipments of iron, although this tonnage is coming largely from Cleveland furnaces. The merchant iron trade continues only two and three carload lots per day. A report appears unfounded of a tonnage inquiry for low phosphorus pig iron, as but one user in the Pittsburgh district purchased foreign low phosphorus iron last fall. A new foundry at Charleroi, Pa., largely with electric furnace capacity, which would require no iron, is reported preparing for operations. The price situation on the few carloads of merchant iron moving presents wide variation. On competitive bidding, foundry iron has been sold down below $14, Pittsburgh, but a nominal price of $15 is said to prevail on some business, according to credit conditions. Bessemer and basic iron business is slow.

Boston—Pig iron selling is light, with little inquiry. Eastern Pennsylvania iron has sold at some New England points at $15.25, delivered, but this price still is higher than that at which foreign iron can be delivered, although it is an increasing factor in some small lot business.

New York—A small lot of Dutch iron is due at Port Newark, N. J., this week, the first to arrive in the northern New Jersey district. Domestic buying is light, one or two cars at a time. Foundries are carrying little stock.

Buffalo—There is a scattering of 100-ton orders and inquiry for pig iron, but tonnage transactions are entirely lacking. The $16 local base is maintained. February shipments equaled the daily average for January.

Cleveland—February pig iron shipments are 10 per cent larger than the volume for January, the gain being accounted for entirely by the automotive industry's requirements. During the week releases from stove and radiator manufacturers improved slightly. An Ohio melter is inquiring here for 350 tons. Actual sales have shown no tendency to increase. Prices are nominal at $15, base, furnace, for local delivery; and $13.50 to $14 for delivery to outside competitive areas.

Philadelphia—Offers of Japanese pig iron here have been withdrawn. A cargo of over 4000 tons of Dutch iron has arrived at Port Newark, N. J., of which over half is going to a Delaware river pipe plant. Carloads usually are the limit of sales. E. J. Lavino & Co. last week lighted a furnace at Sheridan, Pa., on ferromanganese.

Cincinnati—Sales of pig iron were restricted to scattered carload lots, excepting one order for 300 tons from an Indiana melter which attracted keen competition from furnaces outside this district.

Chicago—Pig iron shipments continue to show a moderate increase over January, although an additional upturn recently has been lacking. Requirements of the automotive industry are steady, and smaller foundries gradually are becoming more active in the market. Demand from the farm implement industry is in small lots. The $15.50, furnace, price for No. 2 foundry and malleable continues steady.

St. Louis—The market has a brighter tone, with stove plants beginning seasonal production and implement and machinery manufacturers preparing for larger output. A larger movement of southern iron to this district is noted.

Toronto, Ont.—Demand for merchant iron is holding to recent levels, with weekly purchases amounting to about 500 tons. The melt continues at 15 per cent.

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Detroit, Mich.

Steel Sales Corp.
129 South Jefferson St.
Chicago, Ill.

H. L. Brown,
2001 Carew Tower
Cincinnati, Ohio

Ferromanganese Reduction Limited in Some Instances

Ferroalloy Prices, Page 43

Ferromaganese sales have not been greatly stimulated by the recent reduction of $7 a ton to $61 as the domestic price of spot material. One maker has advised consumers $61 would rule until further notice; another is announcing that the price for the month will be set at the beginning of the period, with $61 for the remainder of February, and the March figure still to be determined. Spiegeleisen is unchanged at $24, furnace, for 19 to 21 per cent.

Coke

Foundry Demands More Diversified, with Moderate Gain for the Month in Middle West

COKE PRICES, PAGE 43

Pittsburgh—By-product coke for domestic use continues to show a fair volume of sales but all coke business is for immediate delivery. Furnace coke is moving at $1.75 to $1.85, or less. Common brands of foundry coke are $2.25 to $2.50, beehive ovens. Premium brands generally are $4.

Cincinnati—No apparent pickup in shipments of by-product foundry coke is noted in this market. Buying remains close to immediate needs. Sales of domestic coke are showing a seasonal trend downward.

Chicago—February coke shipments increased over January, both foundry and the domestic fuel recording gains. Foundry requirements are increasing slowly, but demand is more diversified than a month ago. Heating coke has lost considerable of its previous activity as a result of mild weather. Foundry coke continues $7, ovens, for outside delivery and $7.75, delivered Chicago.

St. Louis—One by-product coke interest here reports its February metallurgical shipments heavier than January's, though in the aggregate not much change is noted. Prices are firm.

Birmingham, Ala.—Local demand for coke is slow. While much domestic coke is still moving by rail and water, the market is not active. Production is being held down.

Steel Pipe Placed

(*Concluded from Page* 42)

er tubes for Puget Sound at $890.14, delivered; bids Feb. 14.

Cast Pipe Pending

1400 tons, 16-inch for San Francisco; bids Feb. 27.

437 tons, 10-inch for new county jail and Sharp's park, San Francisco; bids March 8.

215 tons, Gloucester, Mass.

206 tons, 4 to 8-inch class 150, San Bruno, Calif.; bids March 1.

200 tons, 10 and 12-inch, sewer section, Westchester county, New York.

125 tone, 6 and 10-inch for Medford, Mass.; Warren Pipe & Foundry Co., Wharton, N. J., low.

Steel Pipe Pending

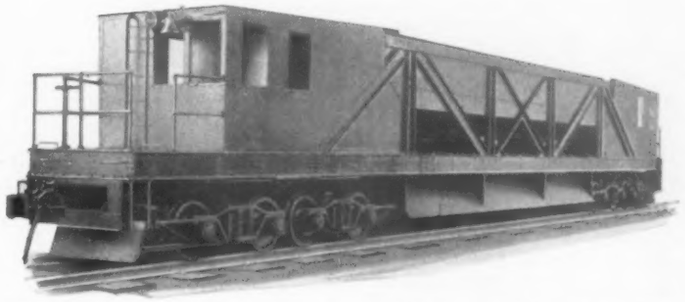
101 tons, copper-nickel alloy tubes, navy, Boston, Brooklyn, Philadelphia and Puget Sound, Wash.; bids in Feb. 28.

Unstated tonnage, 1780 feet, 4.145 o.d., 0.4475-inch wall cold-drawn seamless tubing and 1460 feet, 3.26 o.d., 0.1094-inch wall, seamless tubing, supply officer, navy yard, Washington; bids Feb. 28 for delivery by April 3.

Unstated tonnage, 8120 feet standard welded pipe, including 7500 feet 1¼-inch galvanized, remainder 5-inch and ¼-inch black, navy, Puget Sound, Wash., Republic Pipe & Iron Co., Brooklyn, low, $1046.10, delivered.

E. L. Kurth, vice president of the Lufkin Foundry & Machine Co., Lufkin, Tex., has presented to the city of Lufkin a fully equipped library, provided for in the will of J. H. Kurth Sr., founder and late president of the company, who died in 1931.

ATLAS ORE TRANSFERS



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Engineers . . . Manufacturers

CLEVELAND, OHIO

Scrap

Export Buying, Domestic Needs Hold Situation Steady—Some Accumulation Is Being Done

Chicago — Scrap prices remain steady with quotations on a few grades higher. Heavy melting steel is unchanged at $5 to $5.50, although in covering old orders dealers generally are bidding $5.25 or more. New buying is small and shipments against contracts are unimproved. Supplies are light since railroads are disposing of only a portion of their accumulations. Cast iron borings are up 25 cents at $3.25 to $3.75.

Pittsburgh — The market shows no added strength, but some signs of easiness in view of dealers' willingness to sell No. 1 steel at $8.50 and slightly less in this district. A few minor purchases of hydraulic compressed sheets featured the market last week with the Follansbee,

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	7.00 to 7.50
Boston, dealers	3.00 to 3.25
Buffalo, No. 1	7.00 to 7.25
Buffalo, No. 2	6.00 to 6.25
Chicago	5.00 to 5.50
Cleve., No. 1	7.00 to 7.50
Cleve., No. 2	6.00 to 6.50
Det., No. 1 deal.	4.50 to 5.00
Det., No. 2 deal.	3.75 to 4.25
E. Pa. del. mill	6.50
E. Pa., No. 2 del.	4.50 to 5.00
Federal, Ill.	4.75 to 5.25
Granite City, Ill.	5.00 to 5.50
N. Y., deal. R. R.	5.00
N. Y. deal. No. 2	3.50 to 4.00
N. Y. deal. yd.	2.50 to 3.00
Pitts. No. 1	8.00 to 8.50
St. L. No. 1 set	5.50 to 6.00
Valleys, No. 1	8.50 to 9.00

COMPRESSED SHEETS

Buffalo, dealers	6.00 to 6.25
Chi. (Factory)	4.00 to 4.50
Cleveland	6.50 to 7.00
Detroit, dealers	4.00 to 4.50
E. Pa. new mat.	5.00 to 6.00
Pittsburgh	8.00 to 8.50
Valleys	8.00 to 8.50

BUNDLED SHEETS

Buffalo	4.00 to 4.50
Cincinnati, del.	4.00 to 4.50
Cleveland	4.50 to 5.00
Eastern, Pa.	5.00
Pittsburgh	7.00 to 7.50
St. Louis	1.50 to 2.00

SHEET CLIPPINGS LOOSE

Chicago	2.00 to 2.50
Cincinnati	1.50 to 2.00
Detroit, dealers	1.25 to 1.75
St. Louis	1.50 to 2.00

STEEL RAILS SHORT

Birmingham	8.50 to 9.00
Boston, dealers	3.00 to 3.25
Buffalo	9.50 to 10.00
Chicago (3 ft.)	7.50 to 8.00
Chicago (2 ft.)	8.00 to 8.50
Cincinnati, del.	8.50 to 9.00
Detroit, deal.	8.00 to 8.50
Pitts. (open-hearth, 3 ft. and less)	10.00 to 10.50
St. Louis	7.00 to 7.50

STOVE PLATE

Birmingham	5.00 to 5.50
Boston, dealers	2.00 to 2.50
Buffalo	7.00 to 7.25
Chicago, net	4.50 to 5.00
Cinci., deal. net	3.50 to 4.00
Det., net deal.	2.50 to 3.00
Eastern Pa.	5.50 to 6.00
N. Y., deal. mill	2.50 to 3.00
St. Louis	5.50 to 6.00

COUPLERS, SPRINGS

Buffalo	8.50 to 9.00
Chicago	6.50 to 7.00
Eastern Pa.	8.00 to 8.50
Pittsburgh	9.50 to 10.00
St. Louis	5.25 to 6.25

ANGLE BARS—STEEL

Chicago	7.00 to 7.50
St. Louis	5.75 to 6.25

LOW PHOSPHORUS

Buffalo, billets and bloom crops	8.50 to 9.00
Cleveland bil. and bloom crops	10.00 to 11.00
Eastern Pa.	8.00 to 8.50
Pittsburgh billet bloom crops	10.50 to 11.00
Pitts., sheet bar crops	10.50 to 11.00

FROGS, SWITCHES

Chicago	5.00 to 5.50
St. Louis	5.00 to 5.50

SHOVELING STEEL

Chicago	5.00 to 5.50
Cleveland	5.75 to 6.00
St. Louis	4.75 to 5.25

RAILROAD WROUGHT

Birmingham	7.50 to 8.00
Boston, dealers	1.00 to 1.50
Buffalo, No. 1	4.25 to 4.75
Buffalo, No. 2	7.00 to 7.25
Chi., No. 1, net	4.50 to 5.00
Chicago, No. 2	5.00 to 5.50
Cinci., No. 2	5.00 to 5.50
Eastern Pa.	6.50
N. Y., No. 1. deal.	2.50 to 3.00
Pitts., No. 1	8.00 to 8.50
St. Louis, No. 1	3.50 to 4.00
St. Louis, No. 2	5.00 to 5.50

SPECIFICATION PIPE

Boston	3.00 to 4.00
Eastern Pa.	6.00 to 7.00
N. Y., deal	2.00 to 2.25
St. Louis	4.75 to 5.25

BUSHELING

Buffalo, No. 1	6.00 to 6.25
Chicago, No. 1	3.50 to 4.00
Cinci., No. 1 dl.	4.00 to 4.50
Cinci., No. 2	2.50 to 3.00
Cleve., No. 2	4.00 to 4.50
Det., No. 1 new deal.	3.50 to 4.00
St. L., No. 1	3.00 to 3.50
Val. new No. 1	8.50 to 8.75

MACHINE TURNINGS

Birmingham	2.50 to 3.00
Boston, dealers	0.75 to 1.00
Buffalo	3.50 to 4.00
Chicago	3.25 to 3.75
Cinci., deal	3.00 to 3.50
Cleveland	4.00 to 4.25
Detroit	2.00 to 2.50
Eastern Pa.	3.00 to 3.50
N. Y., deal.	1.35 to 1.50
Pittsburgh	6.25 to 6.75
St. Louis	1.50 to 2.00
Valleys	6.25 to 6.75

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	0.75 to 0.90
Buffalo	3.00 to 3.50
Cinci., deal	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit, deal.	2.50 to 3.00
Eastern Pa.	3.50 to 3.75
N. Y., deal.	1.35 to 1.50
Pittsburgh	5.50 to 6.00

CAST IRON BORINGS

Birming., chem.	12.00 to 13.00
Birming., plain	2.50 to 3.00
Boston, chem.	5.50 to 6.00
Boston, dealers	1.00 to 1.25
Buffalo	3.50 to 4.00
Chicago	3.25 to 3.75
Cinci., deal.	3.00 to 3.50
Cleveland	4.50 to 5.00
Detroit, deal.	2.50 to 3.00
Eastern Pa.	3.50 to 3.75
E. Pa., chem.	8.00 to 10.00
N. Y., deal.	1.00 to 1.50
Pittsburgh	5.75 to 6.25
St. Louis	2.00 to 2.50

PIPE AND FLUES

Cinci., deal.	3.25 to 3.50

RAILROAD GRATE BARS

Buffalo	4.00 to 4.50
Chicago, net	5.00 to 5.50
Cincinnati	4.00 to 4.50
Eastern Pa.	5.50 to 6.00
N. Y., deal.	3.50 to 4.00
St. Louis	4.50 to 5.00

FORGE FLASHINGS

Boston, dealers	2.00 to 2.50
Buffalo	5.50 to 6.00
Cleve. ov. 10 in.	6.00 to 6.50
Detroit	2.75 to 3.25

FORGE SCRAP

Boston, dealers	1.75 to 2.00
Chicago	6.50 to 7.00
Eastern Pa., del.	5.00 to 5.50

ARCH BARS, TRANSOMS

Chicago, net	5.00 to 5.50
St. Louis	3.50 to 4.00

AXLE TURNINGS

Boston, deal.	2.50 to 3.00
Buffalo	6.00 to 6.25
Chi., elec. fce.	4.50 to 5.00
Cleveland	5.50 to 6.00
Eastern Pa., del.	6.00 to 7.00
Pittsburgh, O. H.	7.00 to 7.50
St. Louis	3.00 to 3.50

STEEL CAR AXLES

Birmingham	9.00 to 9.50
Boston, ship. pt.	5.50 to 6.50
Buffalo	10.00 to 10.50
Chicago, net	8.50 to 9.00
Eastern Pa.	14.50
St. Louis	8.75 to 9.25

SHAFTING

Boston, ship pt.	6.50 to 7.00
Eastern Pa.	11.00 to 12.00
N. Y., deal.	5.50 to 6.00
St. Louis	7.50 to 8.00

CAR WHEELS

Birming., iron	6.50 to 7.00
Boston, iron deal.	3.00 to 3.25
Buffalo, iron	7.00 to 8.00
Buffalo, steel	8.50 to 9.00
Chicago, iron	8.00 to 8.50
Chi., rolled steel	7.00 to 7.50
Cincinnati iron	6.25 to 6.75
E. Pa. iron	8.50
E. Pa. steel	8.00 to 8.50
Pitts., iron	7.75 to 8.25
Pitts., steel	9.00 to 9.50
St. Louis, iron	4.75 to 5.25
St. Louis, steel	6.00 to 6.50

NO. 1 CAST SCRAP

Birmingham	7.00 to 7.50
Boston, textile	6.75 to 7.00
Boston, No. 2	2.00 to 2.25
Buffalo (Mach.)	9.50 to 10.00
Buffalo, cupola	9.00 to 9.25
Chi., mach. net	5.75 to 6.25
Chi., railroad net	5.50 to 6.00
Chicago, agri., net	5.00 to 5.50
Cinci., mach. cup	6.50 to 7.00
Cleve. cupola	7.00 to 8.00
Det., net deal.	6.50 to 7.00
E. Pa. cupola	9.00 to 9.50
N. Y., cup. deal.	4.50 to 5.00
N. Y., del. local foundries	7.00 to 7.50
Pitts., cupola	9.00 to 9.50
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. L. No. 1 mach.	6.00 to 6.50
St. L. No. 1	5.50 to 6.00

HEAVY CAST

Boston, del.	3.25 to 3.50
Bost., mach. cast	7.00 to 7.50
Buffalo, break	6.50 to 7.00
Cleve., break	5.50 to 6.00
Detroit, auto net deal.	7.00 to 7.50
Det. break., dl.	4.00 to 4.50
Eastern Pa.	8.00 to 8.50
N. Y. No. 1, dl.	4.50 to 5.00
N. Y. break, dl.	4.00 to 4.50
Pittsburgh	8.00 to 8.50

MALLEABLE

Boston, consum.	6.75 to 7.25
Buffalo	8.00 to 8.50
Chicago, agri.	5.00 to 5.50
Chicago, R. R.	5.50 to 6.00
Cinci., agri. del.	6.00 to 6.50
Cinci., R. R., del.	6.50 to 7.00
Cleveland, rail	7.50 to 8.00
Det. auto deal.	5.00 to 5.50
St. Louis	7.00 to 7.50

RAILS FOR ROLLING
5 feet and over

Birmingham	7.50 to 8.00
Boston, deal.	5.00 to 5.50
Buffalo	7.00 to 7.50
Chicago	7.50 to 8.00
Eastern Pa.	9.50
New York dealer	3.75 to 4.25
St. Louis	7.00 to 7.50

LOCOMOTIVE TIRES

Chicago, cut	7.00 to 7.50
St. L., No. 1	5.00 to 5.50

LOW PHOS. PUNCHINGS

Chicago	7.00 to 7.50
Buffalo	9.00 to 9.50
Eastern Pa.	8.00 to 8.50
Pittsburgh	9.50 to 10.00

W. Va., consumer buying a small lot and likewise a tonnage being sold into Youngstown, O. Another buyer at Youngstown bought some No. 1 cast and blast furnace borings and turnings. An unusual feature was noted in the scrap market here last week when a manufacturer on Neville Island began laying down iron and steel car wheels and axles for investment purposes. About 30 carloads have been purchased with the possibility that in all 5000 tons may be laid down. The prices paid range around $8 for iron wheels with up to $9.25 on steel wheels and around $10 for axles. This is the first scrap to be laid down in this district with a view toward capital appreciation since dealers ceased adding to their yard stocks some time ago.

Philadelphia—An Eastern Pennsylvania steel mill has bought 5000 tons of No. 2 melting steel at $5, delivered. While domestic scrap buying is generally slow, consumers appear more interested as a result of increasing scrap shipments to Japan and Europe. Charles Dreifuss & Co. is now loading a ship here for Europe, paying slightly under $4, f.a.s., for No. 2 melting steel for Europe and around $5.25, f.a.s., for No. 1 melting steel for Japan.

Boston—Low scrap prices confine light business to water shipments and a limited movement to New England consumers. Prices for No. 1 steel for barge loading are inclined to firmness and some additional export business is expected.

New York—Buying for export against contract accounts for most activity in scrap, although fair shipments of stove plate are going to Bayonne, N. J., at $4.50, barge, and some cast is being moved to a New Jersey cast pipe interest at $4.50, barge. Little or no new export business has been taken. For shipments abroad, dealers continue to pay $5 for No. 1 and $3.50 for No. 2, although some of the latter grade has been bought at $4, barge.

Buffalo—Dealers report a firm situation in scrap. Purchasing agents have admitted that large tonnages cannot be obtained at present nominal prices and that any tonnage transactions would boost quotations 50 cents to $1 a ton. There has been growing difficulty in obtaining stove plate for local delivery at present prices.

Cleveland — Consumers of scrap continue to confine interest to accepting restricted shipments. Blast furnace material is scarcer and arrival of a steamer load from Detroit Friday has supplied about 1000 tons to a local user.

Detroit — Iron and steel scrap prices continue steady with the exception of a slight rise in borings and turnings, which are in demand for the local blast furnaces. Blast furnace scrap is shorter than any other grade. The bank holiday is restricting trading of some small dealers. With automobile production declining, the prospect is for a smaller volume to be available over the next month.

Cincinnati — Prices of iron and steel scrap remain nominally unchanged in a stagnant market. Dealings the past week were for small lots. Mills forego heavy contracts while awaiting improvement in production. Material moving against old commitments, and stocks on hand appear adequate for current needs.

Birmingham, Ala.—Occasional carloads make up present movement in steel and iron scrap, with no sign of improvement in volume.

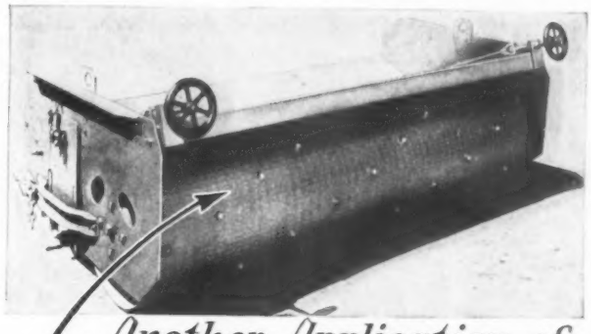
St. Louis—Steel and iron scrap continues quiet, with sales confined to small scattering lots for prompt shipment. Shipments on contracts, however, hold up fairly well, and some inquiry for cast and malleable grades has come out, the first in several weeks. Due to its cheapness, some melters are planning to utilize heavier percentages of scrap in their mixtures.

Toronto, Ont. — Canadian scrap markets continue spotty, with sales mostly in a few special grades. No. 1 machinery cast is moving at a fair rate and dealers are importing to meet demands. Stove plate and malleable have some call, but no large orders are reported, while other iron grades are moving slowly. Steel scrap is at a standstill with mills out of the market.

Forging Billets in Better Demand; Prices Steady

Semifinished Prices, Page 43

The $26 open market quotation on sheet bars, billets and slabs is not being tested by tonnage. A few nonintegrated steel producers are specifying these products, usually on old contracts. Demand for forging billets has picked up slightly, and remain $31, Pittsburgh. Wire rods are $35, Pittsburgh or Cleveland, with skelp 1.50c to 1.60c.



Another Application of
"KNOBBY" NON-SKID STEEL
CENTRAL FLOOR PLATES

They are used on the "Handy Rol-Roc" rock spreader because of their extreme durability—freedom from fracture, chipping, deformation, and their unique surface gripping qualities.

Where can you use such a plate? Write for sample and full information.

CENTRAL IRON & STEEL CO.
HARRISBURG, PENNA.

UNDERWRITERS' LABORATORIES INSPECTED S-A-443 REG. U.S. PAT. OFF.

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 5.50c, Conn., for copper

SHEETS	
Yellow brass (high)	11.00
Copper, hot rolled	13.62½
Lead sheets, cut, to jobbers	7.00
Zinc sheets (100-lb. base)	9.00
TUBES AND PIPES	
Seamless yellow brass (high)	13.25
Seamless copper	12.37½
RODS	
Yellow brass (high, full turning)	8.50
Naval brass	9.62½
ANODES	
Copper, untrimmed	10.50
WIRE	
Yellow brass (high)	11.00

Old Metals

Dealers' buying prices, cents lb.

NO. 1 COMPOSITION RED BRASS	
New York	2.37½ to 2.62½
Chicago	2.00 to 2.12½
Cleveland	2.25 to 2.50
St. Louis	2.25
HEAVY YELLOW BRASS	
New York	1.75 to 1.87½
HEAVY COPPER AND WIRE	
New York	3.62½ to 3.82½
Chicago, No. 1	2.87½ to 3.00
Cleveland	2.75 to 3.00
St. Louis	2.50
COMPOSITION BRASS BORINGS	
New York	2.25 to 2.50
YELLOW BRASS TUBING	
Cleveland	1.50 to 1.75
LIGHT COPPER	
New York	2.75 to 2.87½
Chicago	2.00 to 2.12½
Cleveland	2.25 to 2.50
St. Louis	2.25
LIGHT BRASS	
Chicago	0.87½ to 1.00
Cleveland	1.00 to 1.12½
St. Louis	1.25
LEAD	
New York	2.00 to 2.25
Cleveland	1.50 to 2.00
Chicago	1.75 to 2.00
St. Louis	2.00
ZINC	
New York	1.12½ to 1.25
Cleveland	0.87½ to 1.00
Chicago	0.87½ to 1.00
St. Louis	1.25
ALUMINUM	
Clippings, new, soft, Cleve.	9.50 to 10.00
Clippings, hard, Cleveland	6.00 to 7.00
Borings, Cleveland	2.50 to 3.00
Mixed cast, Cleveland	3.75 to 4.00
Mixed cast, St. Louis	4.00 to 4.25

Secondary Metals

Brass ingot, 85-5-5-5	5.25
Remelt aluminum No. 12	8.00 to 9.00

Metals

Steadier Situation Develops in Zinc—Copper Maintains Firm Tone—Lead Holds Steady

New York—A steadier situation in zinc featured the metals last week. Copper, lead, aluminum and nickel held firm but antimony eased slightly and silver went higher. Tin showed little change. Sales generally were in light volume.

Copper—Custom smelters continued to quote electrolytic metal 5.00c, Connecticut, for delivery through second quarter. Sales last week mostly were for delivery into second quarter. No indication has appeared that producers will extend the 5-cent price to third quarter. Copper and brass products showed no change. No price cutting was in evidence. Katanga, the low-cost African producer, is expected to step up output March 1 to 56,000 tons annually from the current rate of 40,000 tons.

Lead—Prices held steady despite the publication of statistics showing that stocks jumped 8536 tons in January to a high of 184,693 tons. It was clear that the statistics were no aid to consumer confidence, however.

Zinc—Price irregularity in the market disappeared during the week and the market firmed up to the basis of 2.60c and 2.65c, East St. Louis, for delivery through March. Opinion in the trade was to the effect that the appearance of only moderate demand would quickly lift the price level. The measurably improved situation in the Tri-State ore field has been a supporting factor for some time. High grade zinc sellers have maintained a firm stand at the 4.50-cent price established several months ago.

Tin—Quotations were well maintained although slightly under the level of the preceding week. Fluctuations in sterling exchange made prices somewhat uncertain at times but the London market was a supporting factor.

Antimony—Metal appeared in the market at 5.62½c, New York, despite reports that China may place an embargo into effect.

Silver—Approval of a silver purchase bill by a House committee brought the metal above the 27-cent level.

Benzol in Greater Demand

New York—Benzol is slightly more active, but other distillates are unchanged, lacquer makers ordering toluol slower than expected due to uncertainty in automotive activities. Sulphate of ammonia is active, as the usual best seasonal demand of the year approaches. Price for March will be unchanged at $22 a ton, Atlantic port. Consumers of naphthalene also are ordering heavier against contracts and some small spot business is being done. Routine demand for phenol is unchanged.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.20
90 per cent benzol	0.20
Toluol	0.30
Solvent naphtha	0.26
Comercial xylol	0.26

Per Pound at Producers' Plants in 250-Pounds Drums

Phenol	0.153 to 0.173

Per Pound at Producers' Plants

Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75

Per 100 Pounds Atlantic Seaboard

Sulphate of ammonia	$1.10

Quicksilver Steady

New York—Quicksilver prices are steady at $49 to $50, a virgin flask of 76 pounds, the latter price applying to small lots. Some sellers report fairly good business.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper			Straits Tin New York		Lead	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Ingot Nickel
	Electro., del. Conn.	Lake, del. Midwest	Casting, refinery	Spot	Futures	N. Y.					
Feb. 18	5.00	5.12½	4.75	23.50	23.60	3.00	2.87½	2.55	22.90	5.75	35.00
Feb. 20	5.00	5.12½	4.75	23.60	23.70	3.00	2.87½	2.60	22.90	5.62½	35.00
Feb. 21	5.00	5.12½	4.75	23.45	23.55	3.00	2.87½	2.60	22.90	5.62½	35.00
Feb. 22—Holiday											
Feb. 23	5.00	5.12½	4.75	23.45	23.55	3.00	2.87½	2.60	22.90	5.62½	35.00
Feb. 24	5.00	5.12½	4.75	23.30	23.40	3.00	2.87½	2.65	22.90	5.62½	35.00

Pacific Coast

Business Gains Over 1932 Sales —San Francisco Bridge Steel Lettings Set for Early March— Northwest Activity Greater as Season Advances—Prices Show No Definite Change

San Francisco—(*By Air Mail*)—Demand is confined to small lots and only two projects calling for 100 tons or more of steel are reported placed. Bids will be opened March 7 and 8 for three additional units of the San Francisco-Oakland bridge, involving over 63,000 tons of shapes, plates and bars.

Gulf States Steel Co. secured the largest reinforcing bar award of the year, 1700 tons, for 11 buildings at Fort Miley, Calif. Pacific Coast Steel Corp. booked 120 tons for a bridge at Knights Landing, Calif. For the first time this year awards exceed those for the same period last year. To date 5846 tons have been placed, compared with 4902 tons in 1932.

Bids open March 7 and 8, respectively, for 2200 tons for the Yerba Buena island crossing of the San Francisco-Oakland bridge and 2458 tons for the San Francisco anchorage, 1400 tons, and for the East Bay superstructure, 1058 tons. Prices on out-of-stock material remain weak at 2.00c, base, on carload lots.

No plate awards of size were noted. Bids open March 7 for 1500 tons for tunnel lining for the Yerba Buena crossing of the San Francisco-Oakland bridge. Bids open March 8 for 400 tons for two 500-horsepower boilers for the General hospital, San Francisco. Prices are general at 1.85c, c.i.f.

A number of new structural projects have come out for figures. Bids open March 7 for 1500 tons for Yerba Buena island crossing, San Fancisco-Oakland bridge, and March 8 for San Francisco anchorage, calling for 1363 tons, and on the same date for East Bay superstructure, involving a total of 54,125 tons, composed of 28,075 tons of silicon steel, 22,650 tons of carbon steel and 3400 tons of nickel steel. New bids will be opened March 8 for 735 tons for a ward for the General hospital, San Francisco. Bids have been opened on 450 tons for a postoffice at San Jose, Calif. Prices are firm and standard shapes hold at 2.10c, c.i.f., with wide flange material quoted at 2.20c.

Northwest Buying Better

Seattle—Steel awards in the Pacific Northwest this week exceeded 500 tons, including structurals, reinforcing and cast iron pipe.

The week's largest award went to the Universal Pipe Co., Birmingham, Ala., for 264 tons of 4, 6 and 10-inch cast iron pipe for Fort Lewis, Wash., West Coast Construction Co., Seattle, general contractor. Isaacson Iron Works, Seattle, booked 160 tons for the Chehalis, Wash., postoffice and a crane and lighthouse department building at Ketchikan, Alaska.

Northwest Steel Rolling Mills, Seattle, took 100 tons for a wharf and warehouse extension for the Port of Seattle and highway projects in Eastern Washington. Fifty tons of reinforcing for the Chehalis postoffice went to the Pioneer Sand & Gravel Co., Seattle, sales agency for the Columbia Steel Co.

King county, Washington, is preparing plans for a 400-foot steel bridge, bids to be invited in May. Tacoma has budgeted $1,335,420 for water system extensions this year, to include a steel standpipe, 6000 feet of 48-inch steel pipe, 35,500 feet of 54-inch, 11,000 feet of 42-inch, 7500 feet of 58-inch steel pipe, a total of about 2500 tons of plates.

Opening of bids by the United

(*Please turn to Page* 51)

Steel in Europe

Britain and Continent Find Conditions Better

London—(*By Cable*)—Further expansion is expected as specifications appear for steel for new ships recently ordered. Preparations are afoot for relighting several blast furnace stacks in the Middlesbrough district in March. There are prospects of improvement in demand from the Dominions, but demands at home are quiet. Recent contraction in imports of semifinished steel, due to the rise in Continental prices, is diverting orders to Welsh steelworks.

The Continental market is quiet and prices are firm. Buying has been suspended pending constitution of selling agencies. German steel mills are inactive, but sentiment is improving as a result of higher prices.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Feb. 23

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports	£ s d	Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	£ s d	£ s d
PIG IRON					
Foundry, 2.50-3.00 Silicon	$10.00	2 18 6	$8.27		1 14 0
Basic bessemer	9.23	2 14 0*	6.57		1 7 0
Hematite, Phos. .03-.05	10.09	2 19 0	.....		.....
SEMIFINISHED STEEL					
Billets	$17.10	5 0 0	$10.46		2 3 0
Wire rods, No. 5 gage	25.65	7 10 0	21.90		4 10 0
FINISHED STEEL					
Standard rails	$26.51	7 15 0	$26.77		5 10 0
Merchant bars	.99c	6 10 0	.58c		2 12 6
Structural shapes	1.13c	7 7 6	.50c		2 5 0
Plates, †¼ in. or 5 mm.	1.30c	8 10 0	.74c		3 7 6
Sheets, black, 24 gage or 0.5 mm.	1.30c	8 10 0	1.29c		5 17 6
Sheets, gal., 24 gage, corr.	1.61c	10 10 0	1.49c		6 15 0
Bands and strips	1.19c	7 15 0	.74c to .77c		3 7 6 to 3 10 0
Plain wire, base	1.41c	9 5 0	1.18c		5 7 6
Galvanized wire, base	1.68c	11 0 0	1.38c to 1.40c		6 5 6 to 6 7 6
Wire nails, base	1.84c	12 0 0	1.27c		5 15 0
Tin plate, box 108 lbs.	$ 2.74	0 16 0	.....		.....

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d			French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$10.69	3 2 6 @	$ 8.10	205	$ 8.43	300	$16.53	69
Basic bessemer pig iron	10.09	2 19 0*@	6.32	160	7.87	280	18.08	75.50
Furnace coke	2.31	0 13 6	4.74	120	3.09	110	4.61	19.25
Billets	17.10	5 0 0	14.43	370	10.26	365	23.11	96.50
Standard rails	1.26c	8 5 0	1.25c	697	1.50c	1,150	1.44c	132
Merchant bars	1.03c	6 15 0	.95c	530	.60c	465	1.20c	110
Structural shapes	1.34c	8 15 0	.99c	550	.60c	465	1.17c	107.50
Plates, †¼-in. or 5 mm.	1.34c	8 15 0	1.17c	650	.74c	570	1.38c	127
Sheets, black	1.45c	9 10 0§	1.44c	800‡	.91c	700‡	1.57c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	1.80c	11 15 0	2.39c	1,325	1.87c	1,440	4.03c	370
Plain wire	1.42c	9 5 0	2.03c	1,130	1.69c	1,300	1.93c	177
Bands and strips	1.45c	9 10 0	.90c	500	.81c	625	1.38c	127

*Basic. †British ship-plates, Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) Delivered.

STEEL, WROUGHT AND CAST IRON PIPE, AND TUBING

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel In.	Blk.	Gal.	Iron In.	Blk.	Gal.
⅛ & ¼	57	34	½	28	10½
⅜	62	49½	¾	33	16½
½	65½	55	1—1¼	36	20½
¾	67½	57	2	38	21

LAP WELD

2	61	50½	2	26	12½
2½ to 6	64½	54	2½—3½	33	18½
8	62	51	4—6	35	22
10	60	49	7—8	34	21½
12	59	48	9—12	31	16½

BUTT WELD

Extra strong, plain ends

⅛	48	33	¼ & ⅜	+7	+41
¼ & ⅜	53½	38½	½	28	12½
½	59	49½	¾	33	17½
¾	63½	54	1—2	39	23

LAP WELD

Extra strong, plain ends

2	59	49½	2	34	18½
2½ to 4	62½	53	2½—4	39	25
5 & 6	62	52½	4½—6	38	24
8	58	47	7 & 8	36	22
10	51½	40½	9—12	26	13½
12	50½	39½			

STEEL LINE PIPE

2 to 3 butt	66½	2½ to 6 lap	63½
2 lap	60	8 lap	61
10 lap	59	12 lap	58

Discounts on steel pipe are net and not subject to any point or preferential. On iron pipe, the discounts are net.

BOILER TUBES

Carload discounts, f.o.b. Pittsburgh

Lap Welded Steel		*Charcoal Iron*	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts same as for hot rolled, in next column. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir. .....$32.00 to 33.00
Four-inch, Birmingham .... 35.00 to 36.00
Four-inch, Chicago ..... 43.40 to 44.40
Six to 24-inch, Chicago..... 40.40 to 41.40
Six-inch and over, N. Y..... 32.00 to 34.50
Four-inch, New York ..... 34.50 to 36.50
Stand. fittings, Bir. base.... $90.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $3 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS

Baltimore*	2.35c
Boston††	2.90c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.40c
Los Ang.	3.30c
New York‡(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.60c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

IRON BARS

Baltimore	2.35c
Boston††	3.10c
Buffalo	3.15c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.35c-3.00c
Boston	3.10c-3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.10c-2.25c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.10c
Los Ang., lcl	2.40c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.60c
San Fran. cl.	2.40c
San Fran. lcl	2.80c
Seattle	3.00c

SHAPES

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	2.85c
Los Ang.	3.30c
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New York(d)	3.30c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	2.80c
Boston††	2.90c-3.00c
Buffalo	3.10c-3.25c
Chattanooga	3.50c
Chicago	2.75c-2.90c
Cincinnati	3.05c
Cleveland	3.00c
Detroit	2.90c-3.05c
Houston	3.35c
Los Ang.	3.60c
New York	3.00c
Portland	4.00c
Phila.*† (e)	2.70c
Pitts.**	2.65-2.90c
San Fran.	3.50c
Seattle	4.00c
St. Louis	3.00c-3.15c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.50c
Boston††	3.85c
Buffalo	3.70c
Chattanooga	3.65c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c
Detroit	3.50c
Los Ang.	4.20c
New York	3.25c
Phila.*†(e)	3.15c
Pitts.**	3.35c
Portland	4.50c
San Fran.	3.90c
Seattle	4.50c
St. Louis	3.70c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Buffalo	4.00c
Boston††	4.05c
Chattanooga	3.95c
Chicago	3.25c-3.50c

††Base 15,000 lbs., extras on less.

Cincinnati	3.90c
Cleveland	3.50c
Detroit	3.75c
Houston	3.57c
Los Ang.	4.50c
New York	3.75c
Phila.*† (e)	3.50c
Pitts.**	3.85c
Portland	5.00c
San Fran.	4.55c
Seattle	5.00c
St. Louis	4.00c
St. Paul	4.19c
Tulsa	5.10c

†BANDS

Baltimore	2.65c
Boston††	3.40c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	2.85c
Los Ang.	3.30c
New York(d)	3.30c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.85c
San Fran.	3.15c
Seattle	3.50c
St. Paul	3.20c
Tulsa	3.45c

†HOOPS

Baltimore	2.65c
Boston	4.90c
Buffalo	3.95c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.30c
New York	3.30c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	3.75c

†New extras apply.

COLD FIN. STEEL

Rounds and Hexagons

Baltimore (c)*	3.48c
Boston	3.60c
Buffalo	3.00c
Chattanooga*	3.65c
Chicago	3.00c
Cincinnati	3.32c
Cleveland	2.95c
Detroit	3.15c
Los Ang. (a)	4.25c
New York(g)	3.54c
Pittsburgh	2.95c
Portland (a)	4.50c
San Fran(d)(f)	5.55c
Seattle (a)	4.50c
St. Paul (a)	3.20c
St. Louis	3.36c
Tulsa	4.65c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted.

Phila. bar base	3.35c

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex. only.
(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) Bessemer analysis extras included.
‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.

Equipment

Navy Still in Market for Tools; Other Demand Quiet

Chicago—Machinery markets fail to disclose a definite trend in activity, orders and inquiries continuing at their previous quiet rate. Inquiry for used machine tools recently has been more active, while sales of all types continue slow. Railroads particularly are inactive in the market, the majority of recent purchases coming from miscellaneous industries. A fairly large volume of various types of equipment is pending and sellers believe a material increase in business will result upon a definite improvement in sentiment. Agricutural implement manufacturers have completed what buying programs have been planned for this period, while steel companies also are making few new inquiries. Most plant rehabilitation programs involve only small expenditures.

Worcester, Mass.—While considerable equipment has been placed for navy shops and ships, industrial demand for machinery continues dull with sales and inquiry light. Henry Prentiss & Co. has booked a gear-hobbing machine for Boston at $8124. Rivett Lathe & Grinder Corp., Boston, sold a precision bench lathe for Mountain View, Calif., and Pratt & Whitney Co. a measuring machine for Philadelphia. Warner & Swasey Co., Cleveland, is low on a turret lathe for Portsmouth, N. H. and Reed & Prentice Co., Worcester, on an engine lathe for Mare Island. While the list is not yet active, the Westinghouse organization at Springfield is expected to purchase some equipment later.

New York—Recent flurry in export business in machine equipment has subsided, but there has been a fair increase in miscellaneous domestic industrial demand which in the aggregate accounts for a good volume. Meanwhile demand for government shops and ships has gained. Bids closed last week on six lathes for Norfolk, Va., and this week on four milling machines for Brooklyn.

Pittsburgh—Disposition to purchase steel mill equipment on the part of leading mills in this district appears to be still held in abeyance. Such orders as have come through to the equipment makers here are constituted of minor repair parts and miscellaneous work in general. An inquiry from the Youngstown Sheet & Tube Co. for wire reels was reported active last week, while it is understood the Bethlehem Steel Co. has purchased two heating furnaces and is actively considering the purchase of a 3-high mill for delivery to Sparrows Point, Md. A large independent mill in the Pittsburgh district is believed to be working on plans for early completion of important blast furnace changes. Steel mill roll business is largely of an inconsequential nature and one large steel casting firm in the Pittsburgh district closed down all but one of its divisions last week due to lack of roll business.

Cleveland—No improvement has been registered in sales of machinery and equipment, according to most dealers in this territory. When one dealer was asked how his force managed to keep busy, he replied, "By pounding the pavements and ringing doorbells."

Bids close March 7 on a milling machine, brake drum grinder and brake shoe grinder, and March 8 on a 24-inch shaper, for aircraft shops at Wright Field, Dayton, O.

Marion Steam Shovel Co., Marion, O., is reported to have received an order valued at $500,000, for a 20-cubic yard shovel, a 5-yard loading shovel and other equipment to be used in the coal stripping fields of Illinois.

Los Angeles—Metropolitan Water District of Southern California will open bids on Feb. 28 for tunnel equipment for the Colorado river aqueduct. The list will include compressors, locomotives, motor-generator sets, electric shovels, mucking machines, dump cars and air tanks.

Pacific Coast Markets

(*Concluded from Page* 49)

States Engineer, Portland, Oreg., for dike work at Sand Island, Columbia river, has been set for March 3, for 250 tons of bolts and spikes and 180 tons of relaying steel rails.

Bids have been received by the navy department for 8120 feet of welded steel pipe. The same yard is in the market for various small tonnages of welding rods, bars, and 35 tons of steel hull plate.

Wholesale jobbing trade reports no gain, buying confined to small lots. Mill prices are unchanged at 1.85c for plates, 2.10c for shapes and bars. Sheets are weak and demand is slow. Portland dealers are working under the new price schedule with imported steel 50 cents under domestic.

An inquiry from China involves 3400 tons of 35-pound relaying steel rails. Portland contractors are reported to have purchased 715 tons of 70-pound relays from local jobbers for use on government jetty and dike work along the Oregon coast.

There is not much interest in scrap at present prices. Japan is offering an average of $4.50 gross, taking advantage of low ocean freights. Some automobile scrap has been sold in this market but Oriental buyers have been less active here than on the Atlantic and Gulf coasts. Local turnover of scrap is at a minimum.

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Construction and Enterprise

New England

EAST BRAINTREE, MASS.—Cities Service Co., 60 Wall street, New York, has plans for alteration and installation of a new still in its refinery here, to cost about $60,000.

New Jersey

JERSEY CITY, N. J.—Baker Paint & Varnish Co., 228 Suydam avenue, has let contract to W. Robertson & Son, 15 Exchange place, Jersey City, N. J., for rebuilding its burned factory, at a cost of about $30,000.

NEWARK, N. J.—J. J. Hockings, 829 Broad street, plans construction of a 3-story paint factory, 60 x 200 feet, on Frelinghuysen avenue, to cost about $100,000.

NEWARK, N. J.—National Oil Products Co., Essex street, plans construction of a factory at Harrison, N. J., to cost about $50,000. Henry D. Scudder, 9 Clinton, street, Newark, is architect.

Pennsylvania

MONACA, PA.—City council will take action March 15 on vacation of Twenty-first street to enlarge site for an addition by the Pittsburgh Tube Co. to cost $75,000. Construction will not be undertaken at once.

PHILADELPHIA—Philadelphia Scoop & Scale Mfg. Co. has bought the 2-story brick machine shop, 1-story storage building, 4-story brick factory and 3-story engine and boilerhouse, 1817-23 North Fifth street.

Ohio

CLEVELAND—Seal Pump Products Co. has been incorporated with 100 shares no par value, by Treadway & Marlatt, Union Trust building, Cleveland.

DAYTON, O.—Apex Machine & Tool Co. has been incorporated with 300 shares no par value. W. S. McConnaughey, Dayton, O.

YOUNGSTOWN, O.—Shell Oil Co., Youngstown, O., is having plans made for construction of a bulk oil and gasoline plant on Hawthorne street, including removal of six storage tanks, estimated to cost about $16,000.

Michigan

DETROIT—Riordan Machinery Co., 2233 Tuxedo avenue, has been incorporated with $25,000 capital to manufacture machinery.

GREENVILLE, MICH. — Brooke Brass Co., formed by Brooke L. Stanford, formerly general manager of the Lee Brass Co., Imlay City, Mich., has taken over the plant of the former Bennett Brass Co. and will start production about March 1.

LEELANAU, MICH.—Village council has approved a proposal to build an electric generating and lighting plant to cost about $40,000.

MORENCI, MICH.—Village council is taking engineering estimates for a municipal electric light and power plant and distribution system. A bond issue to meet cost will be voted on this spring.

NORTHVILLE, MICH.—Ambler Furnace & Foundry Co. has been sold by S. W. Ambler to Henry Chambers, Detroit, and the name will be changed to Independent Furnace Foundry Works. The plant produces castings and furnaces.

Indiana

KOKOMO, IND. — Auto-Motive-Air Brake Co. Inc. has been incorporated with 1000 shares no par value to manufacture brakes and other mechanical appliances, by J. Paul Johnson and associates.

Illinois

CHICAGO—Automatic Valve Corp., 201 Carroll avenue, has been incorporated with 300 shares no par value to manufacture control valves and other specialties, by Alfred W. Craven Jr., 140 South Dearborn street, Chicago.

CHICAGO—Franklin Die Casting Co., 2535 Greenview avenue, has been incorporated with $40,000 capital to conduct a commercial diecasting business, by Isadore Kaplan, 11 South LaSalle street, Chicago.

CHICAGO—Moore Powers Electric Mfg. Co., 564 West Randolph street, has been incorporated with $1000 capital to manufacture electrical devices, by Ungaro & Sherwood, 333 North Michigan avenue, Chicago.

CHICAGO—Grunow Illinois Co., 501 North Michigan avenue, has been incorporated with 10,000 shares no par value to manufacture electrical equipment, by Hopkins, Starr & Godman, 110 South Dearborn street, Chicago.

CHICAGO—King Pneumatic Tool Co., 2717 North Ashland avenue, has been incorporated with $50,000 capital to conduct a general foundry business, by Sanders, Childs, Bobb & Westcott, 231 South LaSalle street, Chicago. The name was at once changed to Ashland Machinery Co.

Southern States

WASHINGTON—Bureau of supplies and accounts, navy department, will receive bids as follows: Schedule 9645, March 7, 1900 ball bearings for Newport, R. I.; schedule 9670, March 14, 3350 square feet of galvanized expanded metal for San Diego, Calif.; schedule 9671, March 7, 16,000 pounds ingot aluminum alloy for Washington.

OBERLIN, LA. — Louisiana Power Corp., F. H. Wilmot, president, San Antonio, Tex., is applying to the Reconstruction Finance Corp. for the sale of bonds to finance a hydroelectric plant and irrigation canal on the Calcasieu river near here.

HAZELHURST, MISS.—City council has received a petition from citizens asking erection of a municipal electric light and power plant, to obtain lower rates for electric current. Action awaits proof of validity of signatures on the petition.

Oklahoma

HOLDENVILLE, OKLA.—Crescent Refining Co. has had plans prepared by H. H. Pegg, engineer, Allen, Okla., for a cracking plant at its refinery here, to cost about $40,000.

Texas

BRECKENRIDGE, TEX. — J. W. Wash Mfg. Co. has established a plant here for the manufacture of tourist trailers and oilfield tool racks. J. W. Wash is owner and manager.

HOUSTON, TEX.—Moran Corp., Esperson building, has made a survey for a 10-inch pipeline from the Conroe oil field to Houston, 35 miles.

TYLER, TEX.—Tyler Refining Co. has been incorporated with $25,000 capital to build and operate an oil refinery, by A. F. Knappenberger, president.

Wisconsin

NEKOOSA, WIS.—Nekoosa Foundry & Machine Works Inc. has been incorporated with $25,000 capital, by James C. Dutton, attorney, Nekoosa State Bank building, Nekoosa, Wis.

RACINE, WIS.—Consumers Steel & Supply Co. has been incorporated with 500 shares no par value to deal in iron, steel, brass, wire and similar products, by M. S. Waisman and associates, Racine, Wis.

Pacific Coast

LINDSAY, CALIF.—Frost Protector Co. has been organized by Charles W. Towt to manufacture a device to protect orange groves from frost.

LOS ANGELES—Standard Fence Co., subsidiary of the United States Steel Corp., is building a plant on the San Fernando road, near here, costing about $40,000. It will contain about 10,800 square feet of floor space. It will distribute fencing material in southern California.

PORTLAND, OREG.—Stevens & Koon, Spalding building, engineers, have submitted to the city a plan for a 5000-kilowatt steam or diesel-powered electric generating plant.

THE DALLES, OREG.—Tie-treading plant of the Union Pacific railroad has been damaged to extent of $100,000 by fire and will be rebuilt at once.

SEATTLE—Russel P. Collins and associates, Seattle, are developing a gold property in Mono county Calif., and plan to install a 50-ton stamp mill.

Dominion of Canada

HAMILTON, ONT.—Canadian Westinghouse has added a unit for the manufacture of domestic electrical appliances and refrigerators and is extending its sales and service organization throughout Canada.

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